Section 22 Maine

# Hydrology of Floods Kennebec River Basin Maine Part II

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## EXECUTIVE SUMMARY

This report presents Part II of a hydrologic analysis of flooding in the Kennebec River basin. The study was conducted by the Corps of Engineers under the authority contained in Section 22 of the Water Resource Act of 1972. This study was undertaken at the request of the State of Maine.

In September 1985, the Corps of Engineers completed Part I of the investigation entitled "Hydrology of Floods, Kennebec River, Maine." The study reviewed available hydrologic data on floods and analyzed the development and component contributions of recent floods on the river, most notably; December 1973, April 1979, Spring 1983 and June 1984. The document presented here entitled: "Hydrology of Floods, Part II" addressed the effects of storage reservoirs in the basin on Kennebec River flood development.

The Part II study explored the development of reservoir regulation guidance which might further maximize the incidental flood reduction potential of the upper basin storage facilities, without impacting their hydropower function. All season reservoir regulation guide curves were developed by trial through multiyear sequential hydrologic system simulation. Simulations, using the developed guide curves, indicated that greater reservoir storage could be realized with little impact to the downstream flow regime. Storage capacity equivalent to 6 inches of runoff would be available about 65 percent of the time as compared to 40 percent under actual operations. Guide curve operation would likely minimize the spillage during nonspring refill floods, but would not completely prevent spillage during critical spring refill season floods such as the April 1983 and June 1984 floods. When abnormal spring runoff occurs spillage is inevitable. Therefore, secondary guidance was explored in an effort to modify peak discharge rates of spillage when spillage is eminent. Applying the guidance to the experienced April 1979, April 1983 and June 1984 flood events indicated potential reductions of about 30 percent in peak rates of spillage.

A review of surcharge storage characteristics at the three major storage reservoirs revealed no opportunities for any significant added use of surcharge storage for flood control purposes.

A cursory analysis was made of the relative effectiveness of any new flood control storage in various presently uncontrolled subwatersheds upstream of Waterville, Maine. Resulting average main stem flood stage reduction per 100,000 acre-feet of storage varied from about 1.0 to 2.5 feet for different subwatersheds with the maximum effectiveness indicated for the Carrabassett tributary. A component contribution analysis of the recent major Kennebec River flood of March/April 1987 demonstrated the flood producing potential of runoff from the uncontrolled downstream watersheds. This spring flood was the flood of record generally throughout the mid to lower Kennebec basin and occurring with upper basin reservoirs controlling the runoff from their contributing watersheds. Had it not been for the availability of upper basin reservoir storage, the devastating flood of 1987 would have been considerably worse.

In summary, the Part I and II reports provide hydrologic information, analysis, and guidance in the interest of facilitating a common understanding for planning and designing flood damage reduction projects and programs. The study reveled two flood reduction opportunities on the main stem of the Kennebec River. The adoption of monthly guide curves for the major storage reservoirs in the upper basin could reduce the effective runoff contribution from these watersheds. In the uncontrolled watersheds above Waterville, Maine, potential flood stage reduction could be achieved through the development of additional flood control storage. The amount of flood stage reduction is dependent upon the location of the storage facility.

This study was performed under the Corps of Engineers' Section 22 Program administered by Messrs. John R. Kennelly and John E. Kennedy of the Corps of Engineers, Planning Division, under the direction of Mr. Joseph L. Ignazio. The hydrologic investigation was completed by Messrs. Philip Manley and Mark Gieb of the Hydrologic Engineering Section under the direction of Mr. Richard D. Reardon.

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1. PURPOSE

This Part II report, on the "Hydrologic Analysis of Floods" in the Kennebec River, presents:

a. The results of exploratory system simulation studies in search of reservoir regulation guidance that might maximize the incidental flood control effectiveness of upper basin reservoirs while not impacting their design purpose, i.e., hydropower storage.

b. Information on the relative flood control effectiveness if new reservoir storage were provided in various uncontrolled tributary watersheds.

c. An assessment of the potential for added flood control surcharge storage at the existing upper basin reservoirs.

These issues were studied, at the request of the Maine State Planning Office, as a continuation of the original (Part I) 1985 study report. Also included in this report is a summary hydrologic analysis of the recent major March/April Kennebec River flood.

2. BACKGROUND

In September 1985, the Corps of Engineers completed a study report entitled: "Hydrology of Floods, Kennebec River, Maine." The study was performed for the Maine State Planning Office under authority contained in Section 22 of the Water Resources Development Act (PL 93-251) of 1974. Included in the earlier report were sections on basin description, climatology, streamflow and flood history. Its purpose was to review available hydrologic data on floods and analyze the development, and component contributions, of recent floods on the river, most notably: December 1973, April 1979, April 1983 and June 1984.

As a followup to this earlier report, the State requested Part II studies exploring (a) seasonal "guide curves" for regulating the large headwater storage reservoirs (Brassua, Moosehead and Flagstaff), in the interest of possibly enhancing incidental flood control and, (b) the relative effectiveness if new flood control storage were built on selected uncontrolled tributaries, as well as the potential of surcharge storage use at existing reservoirs.

A map of the Kennebec River basin is shown on plate 1. Principal tributaries and existing reservoir storages are listed in tables I and II.

TABLE I

KENNEBEC RIVER
PRINCIPAL TRIBUTARIES

| Tributary | Drainage Area (sq.mi.)* | Length (miles) | Fall (feet) |
|---|---|---|---|
| Moose River | 722 | 76 | 750 |
| Dead River | 874 | 23 | 570 |
| Carrabassett River | 401 | 35 | 636 |
| Sandy River | 596 | 69 | 1544 |
| Sebasticook River | 946 | 48 | 270 |

* U.S. Geological Survey, Open File Report, "Drainage Areas of Rivers and Streams in the Kennebec River Basin," September 1980.

## 3. RESERVOIR GUIDE CURVES

a. General. Ten hydroelectric dams on the main stem of the Kennebec River make up 95 percent of the total hydropower generating capacity in the Kennebec basin. All the main stem dams are "run-of-river" except Harris (Indian Pond) and Wyman which have storage capacity only for daily or weekly load fitting operations. Principal storage reservoirs in the basin are in the headwaters above Bingham and are used for hydropower regulation. There are 1,132,000 acre-feet of storage in the basin and 1,016,500 acre-feet, or 90 percent, are at the three lakes: Brassua, Moosehead and Flagstaff.

Storage reservoirs are used in hydropower operations to store excess waters during high flow periods for later release and use during low flow periods, thereby, ensuring a

TABLE II

AVAILABLE RESERVOIR STORAGE*
KENNEBEC RIVER BASIN ABOVE BINGHAM, MAINE

| Project | Drainage Area (sq.mi.)** | Surface Area (acres) | Drawdown (feet) | Storage (ac-ft) | Percent |
|---|---|---|---|---|---|
| Brassua Lake | 716 | 8,979 | 30 | 196,500 | 17 |
| First Roach Pond | 70 | 3,270 | 7 | 21,500 | 2 |
| Moosehead Lake | 1,268 | 74,000 | 7.5 | 544,000 | 48 |
| Indian Pond (Harris) | 1,384 | 3,747 | 5 | 19,000 | 2 |
| Moxie Pond | 80 | 1,747 | 8 | 14,700 | 2 |
| Flagstaff Lake | 516 | 17,950 | 35 | 276,000 | 24 |
| Wyman Lake | 2,619 | 3,145 | 20 | 60,300 | 5 |
| | | | | 1,132,000 | 100 |

* Storage Data from U.S. Geological Survey Water Data Report ME-83-1

** From U.S. Geological Survey, Open File Report, "Drainage Areas of Rivers and Streams in the Kennebec River Basin," September 1980 minimum dependable hydropower generation. From a hydropower perspective, water in storage is "money in the bank" and releases in excess of hydropower capacity, are "spillage" or "wastage" and represent revenue lost.

Therefore, reservoir regulation for hydropower generally involves trying to maintain sufficient water in storage to provide hydropower dependability while at the same time maintaining storage space in anticipation of excess runoff. Because of limited storage capacity the majority of hydropower reservoirs are used as "pondage" primarily for daily or weekly "load fitting" operations. It is only the real large storages such as Brassua, Moosehead, and Flagstaff that are of such size as to permit seasonal storage regulation. These storages are generally filled each spring during the snowmelt high flow season and then drawn down during the following summer, fall and winter seasons. The three Kennebec headwater storages are operated as a system to provide a lower main stem flow for hydropower.

Hydropower storage reservoirs, with no design storage for flood control, cannot ensure floodflow reductions during all floods; however, during periods when storage is drawn down for hydropower, their ability to store storm runoff does provide a degree of incidental flood control. The degree of such incidental flood control benefit is a function of the percent of time, and amount, the reservoir is drawn down in its hydropower operation. Such incidental flood control benefits are real if the reduced frequency of flooding does not create public complacency on the part of downstream flood plain occupants, resulting in more flood plain development and thus increased flood damages when the less frequent but unmodified floods do occur. Therefore, appropriate flood plain zoning is a vital feature of any water resource management plan involving incidental flood control by nonflood control reservoirs.

The purpose of the study, reported herein, was to explore the development of reservoir regulation "guide curves" that might tend to maximize the incidental flood control provided by the three upper basin reservoirs, while at the same time not impact on their hydropower function. The exploration studies were facilitated by computer hydrologic system simulations.

b. Procedure. In summary, the study procedure was as follows: the three-reservoir system operation was first simulated for a historical hydrologic period of years to determine the minimum dependable yield of the system during critical drought periods. Secondly, having established the minimum dependable yield and knowing the average system yield, a series of trial simulations were made to establish monthly target release rates, as a function of amount of water in storage (guide curves), that would tend to: (1) maximize regulated flows during normal periods, (2) minimize spillage and wastage during wet periods, and (3) still maintain sufficient water in storage to meet minimum dependable yield during critical drought periods. Striving to meet the above goals would tend to maximize hydropower capability but also maximize incidental flood control storage availability. All system simulations were performed with the aid of the Corps of Engineers computer program HEC-5, "Simulation of Flood Control and Conservation Systems," using a monthly time increment. Streamflow data (system inflow) was determined using the published flow data for the Kennebec River at the Bingham, Maine U.S. Geological Survey gage and adjusting for monthly change in upstream reservoir contents. This computed monthly flow data was then prorated by respective drainage area size to determine monthly reservoir inflows and contributions from uncontrolled local areas. The system was first simulated for the period 1951 to 1984 (34 years) to establish minimum yield. The period 1955 to 1975 (21 years) was then selected as a representative hydrologic period and used as the test period for the numerous subsequent trial simulations.

Though the three reservoir system is operated for a series of main stem hydropower plants, for these simulations the reservoirs were operated for a single main stem index point, that being the Bingham USGS gage site located a short distance downstream of the second largest hydropower project on the Kennebec: Wyman Dam. All hydrologic simulation and guide curve development studies were intentionally made completely independent of any existing or historical operational trends or procedures, thereby, avoiding any prestudy bias or preconceived operational criteria.

Brassua and Moosehead Lakes are two reservoirs in tandem and they operate in parallel with Flagstaff Lake in providing flows to Wyman and other downstream hydropower plants. As previously stated, the three-reservoir system, plus the intervening uncontrolled local, was operated for the Bingham gage as the single downstream index control point. Operating criteria for individual reservoirs was selected to maintain the three storages generally in balance with respect to percentage of total usable storage capacity. The only exception was that when first initiating drafting from full reservoirs, drafting, from Moosehead would precede drawing from Brassua, thus minimizing the possibility of drafting at Brassua while spilling at Moosehead. Similarly, at the lower extreme of storage utilization, Brassua would be emptied before Moosehead to try and avoid Moosehead not being able to meet downstream control flow while there was still water in storage at Brassua.

Guide curves, both monthly and seasonally, were developed by trial simulations and by analysis of average and drought runoff periods. The monthly "guide curves" took the following form. Each month there was an established target flow at Bingham. If total system water in storage was within limits established for the specified month then the system was operated to meet the target flow. If for any month the total system storage fell below the established lower limit, the system would operate for a lower limit minimum flow at Bingham. Similarly, if system storage exceeded the upper limit, the system was operated for an upper limit flow at Bingham. Obviously, in the event inflows minus requested outflows exceeded available storage at any of the three reservoirs, then all excess inflows, above storage capacity, were released downstream.

It is noted that with the simulation used, there were three control flow conditions for each month, either desired flow, minimum flow, or maximum flow. It would be expected that, in an actual day-to-day operation, transitional rather than stepped guide curves would be used to relate control flow versus total system storage.

c. Results. The resulting monthly "guide curves" of Bingham target flow versus total system storage, developed by trial, are shown on plate 2. The simulation studies demonstrated, as is commonly known, that storage refill is generally during the spring runoff period (April to May). Drawdown can commence generally in July and continue throughout the year to the beginning of the subsequent spring refill period. The degree to which storage can be filled in the spring determines the project's ability to ensure a minimum dependable flow throughout the coming year. Progressing through the year, the length of time to the next refill becomes less; therefore, the amount of reserve storage required becomes progressively less. By simulation of several years, sequentially, the monthly minimum storage levels are established which would necessitate going to minimum flow, but, equally important, upper limits are established indicating likely excess of storage to meet normal flow. Excess storage can be released for downstream use, which may reduce later spillage (wastage) during high flow. It is the use and orderly release of excess seasonal storage that would tend to maximize incidental flood control.

As the guide curves indicate, the minimum dependable yield of the system at the index point, Bingham, was found to be about 2,000 cfs, with a normal capability of about 4,000 cfs. The guide curves were developed with an all season minimum required target flow of 2,000 cfs, and all season desired target flow of 4,000 cfs except April. Following a series of simulations, the desired target flow for April was increased to 8,000 cfs in trying to reduce the frequency and magnitude of spillage from filled storages during spring runoff. Maximum target flow was set at 6,000 cfs from June through February with 8,000 for March, 10,000 for April and 8,000 for May.

It is noted that these upper limit release rates are in excess of the hydropower capacity of many of the main stem projects. Maximum capacity in the system is at Wyman, at about 9,000 cfs. The guide curves simply indicate that, at times, the system can provide these higher flows without impacting on later required flow capability and possibly reducing later spillage rates from the storages. The readers of this report should keep in mind that the storage reservoirs are owned and operated for hydropower. From a hydropower perspective there could rightfully be hesitancy at making regulated releases from storage, in excess of hydropower capacity, to minimize the chance of later spillage from storage during a flood period. Hydropower interests might view any flow in excess of hydropower capacity as "wastage" whether it be as a result of spillage from storage during a flood or regulated releases in excess of hydropower capacity.

Upon completion of the system studies, reported herein, a meeting was held on 29 June 1987, with Mr. Corson of the Kennebec Water Power Company, the operator of the three upstream storage reservoirs for downstream owner-clients. The purpose of the meeting was to discuss the studies and inquire of existing operating procedures, criteria and restraints. His plan of operation in general is to maintain a target flow of 3,600 cfs at Madison and then vary up or down from a minimum of about 2,000 cfs to a maximum of about 4,500 cfs, depending on total system storage for the particular month relative to normal storage, as determined from the mean of several years of operation. (Madison is about 25 river miles downstream of Bingham with about 460 square miles of intervening drainage area). He indicated that he had been attempting to draft more in late winter the last few years and relying on spring snowmelt runoff for ample storage refill. He meets at least once a month with the five owner clients regarding operational plans for the next month and he noted that final decisions and recommendations on operation are usually based on varying factors within general guidelines rather than in accordance with any hard rules. Other considerations, though not hard rules or restraints, were that the Fish and Wildlife Service preferred that Moosehead levels not fall below the 10 to 15 October level and that recreational interests would be disturbed if lake levels were significantly below normal during the summer season.

Following development of the seasonal guide curves the results of simulations, using the curves, were compared with actual historic operations. Monthly system operations, both observed and as simulated, for the test period 1955 to 1975 are compared graphically on plates 3 and 4. A computer input-output of an HEC-5 Guide Curve Simulation is appended to this report. Summary plots of average monthly flows at Bingham and system storages, observed and as simulated, are shown on plates 5 and 6. Comparative Bingham flow durations (flow versus percent time) and system storage duration curves are shown on plates 7 and 8.

The bottom line result was that the Bingham flow regime, by guide curve simulation, was remarkably similar to the actual historical flow regime as recorded and published by the U.S. Geological Survey for the Kennebec River at Bingham. On average the simulation indicated about a 20 percent increase in average April flows with a subsequent reduction of about 10 percent for the peak flow month of May (reference plate 5). Simulated flows averaged about 10 percent higher in October and November while about 15 percent lower in February and March. Other months the average flows were nearly identical. Though the flow regime was not markedly different than observed, reservoir storages with the simulation were consistently lower than actual for the historical period (reference plate 6). This is attributed largely to the guide curves calling for increased releases during wetter than normal periods. Simulated storages averaged about 100,000 acre-feet, about 10 percent of total system storage, during the summer season. This 10 percent would represent about 0.7 foot difference in lake level at Moosehead Lake, which might impact recreation. The lower levels of storage resulted in some reduction in (but did not eliminate) spillage during high runoff periods. Most noticeable was the effect during nonspring runoff periods. For example, the December 1973 flood event (water year 1974) resulted from intense rainfall occurring with reservoirs high as a result of an above average runoff summer. The guide curve simulation indicated that the reservoirs would have been drafted sufficiently to store the flood runoff with the maximum monthly control flow at Bingham 6,000 cfs. It is believed that another earlier similar December flood event occurred in 1901.

The monthly guide curve simulations indicated a reduced probability of storage spillage during nonspring refill seasons; however, floods most frequently occur during, or just following, the spring runoff (March 1936, March 1953, April 1979, April 1983 and June 1984) and the guide curve operation was not nearly as effective in eliminating spillage during the spring refill. The guide curves must permit spring storage refill from normal spring runoff; therefore, events that produce abnormally high spring runoff usually result in required spillage at the storage reservoirs and potential for significant contributions to downstream flood flows. Average spring runoff during April and May in the upper Kennebec Basin is about 11 inches or about 46 percent of total annual runoff. Also the April and May runoff can range as high as 17 inches. Total usable storage in the three reservoir system is equivalent to about 10 inches of runoff from their respective watersheds. The total capacity is not available for storage each spring because of the need to retain some water in reserve for unpredictable events such as abnormally low or late spring runoff. Reportedly the lower approximate 1 foot of storage at Moosehead Lake is usually retained both as reserve and due to discharge limitations at the lake outlet.

Because of the high flood sensitivity during the spring season and the limited capability of monthly guide curves to regulate the limited storage for short duration abnormally high runoff events, further exploratory studies were made of potential guide curves for spring refill regulation, using a daily rather than monthly time increment.

d. Spring Refill Guide Curves. The greatest potential for filling and spillage at the upstream storage reservoirs is during the spring refill-runoff period, April, May and June. Greatest spillage contributions to downstream flooding occurs when significant rainfall or snowmelt runoff occurs with the storages initially at, or near, full. Therefore, spring refilling guide curves using a daily time increment, were explored in the interest of minimizing the probability of premature filling of the lakes during the April - May refill period. Any such guide curves would also require that they not increase the probability of not refilling the lakes during drought years. The guide curves were developed by analyzing mean, maximum and minimum lake inflow rates, for the 2-month period April and May, and developing, by trial, total system storage level versus suggested target regulated flow rates at Bingham, to accomplish orderly filling of system storage.

The developed exploratory guide curves are shown on plate 9. In applying the guide curves to experienced high flow events it was found impossible to prevent spillage in most instances; therefore, secondary guidance was explored on project operations during pending flood situations that might modify the peak rate of spillage when spillage was imminent. For example, if storage levels were high and the system was being operated for a target flow at Bingham, in the event of a high runoff occurrence there could be a tendency to cut back releases at the reservoirs, resulting in accelerated filling and later magnified spillage contributing to downstream floods. Secondary guidance was therefore added to the spring refill guide curves that would attempt to modify peak spillage when spillage was imminent. This was accomplished by calling for higher controlled releases from the reservoirs, when storage levels were high, thereby reducing the magnitude of subsequent spillage. The secondary guidance added to the spring guide curves was as follows:

(1) Total System Storage Less Than 900,000 Acre-Feet

(a) Typical Condition. If the guide curve target flow at Bingham is less than 12K and total system storage is less than 900,000 acre-feet (90 percent full) then reservoirs would be operated for the indicated target flow, even to the point of near zero outflow.

(b) Moderate High Storage Early in Season. If the target flow at Bingham is between 12 and 14K and total storage is less than 900,000 acre-feet, reservoirs would be regulated for the 12K target flow but combined outflows would not be made less than 8K.

(c) High Storage Early in Season. If target flow is greater than 14K and storage is less than 900,000 acre-feet, regulation would be for the 14K at Bingham but combined outflows would not be less than 10K.

(2) Total System Storage Greater Than 900,000 Acre-Feet

(a) Typical in Late Spring. If target Q at Bingham is less than 12K but total storage is greater than 900,000 acre-feet then minimum storage outflow would be for target flow or made equal to one-half of the computed rate of inflow to storage, whichever is greater.

(b) Moderate High Storage in Late Spring. If target Q is between 12 and 14K minimum regulated outflow would be 8K or one-half inflow whichever is greater.

(c) High Storage in Late Spring. If target Q is greater than 14K and total storage greater than 900,000 acre-feet, then minimum outflow would be 10K or one-half of inflow, whichever is greater.

The developed spring refill guide curve, shown on plate 9, in concert with the above secondary guidance was tried with the recent spring floods of April 1979, April 1983 and June 1984. As stated earlier, use of the monthly guide curves indicated that there would be no spillage under conditions of a December 1973 flood.

Experienced storage levels at the start of spring refill (1 April) were higher than those resulting with the monthly guide curve simulation; therefore, the spring guide curves were tested under the more severe historical starting (1 April) storage. The results of the three trial floods are summarized in table III. Results indicated that use of the spring guide curves might have reduced peak flow at Bingham from about 40,000 to about 29,000 in April 1979 (27 percent), from about 55,000 to about 47,000 in April 1983 (14 percent) and from about 65,000 to 53,000 cfs (18 percent) in June 1984.

All trials were performed combining all three storages and computing inflow to storage by drainage area ratio with the recorded unregulated Carrabassett riverflows. The unregulated local contribution downstream of the storages above Bingham was also estimated by ratio of drainage area and mean annual runoff with the Carrabassett flows. The resulting regulated outflows from storage using the guide curves were compared with the experienced outflows (reference 1985 report) in determining peak discharge reductions. All trials were also made allowing for no surcharge storage above assumed full system storage capacity of 1 million acre-feet.

Secondly, the spring refill guide curves were tested under the severe droughts of April to May 1957 and 1965 to determine if there would be impact on ability to refill storage sufficient to ensure minimum dependable flow. Since the Monthly Guide Curve Simulation had demonstrated ability to meet the minimum dependable target flow at Bingham, the amount of April to May storage drought refill, using the Daily Spring Refill Guide Curves, was compared with the refill indicated by the monthly simulation. In both test droughts the daily guide curves resulted in April to May refill in excess of that with the monthly curves. However, in both cases the system storage levels were considerably less than experienced. Comparative storage data for the droughts of 1957 and 1965 are shown in table IV. Regarding the developed Guide Curves, the operator of the reservoirs has noted that present hydrologic instrumentation, data transmission

TABLE III

RESERVOIR OPERATION
DURING SPRING REFILL FLOODS
COMPARATIVE DATA

| | April 1979 | April 1983 | June 1984 |
|---|---|---|---|
| MOOSEHEAD-FLAGSTAFF | | | |
| Peak Discharge | | | |
| As Experienced | 18,000± cfs | 26,000± cfs | 34,000 cfs |
| With Guide Curves | 12,000 | 17,000 | 27,000 |
| Δ | 6,000 | 9,000 | 7,000 |
| % | -33% | -34% | -20% |
| Peak Contribution to Bingham Flood | | | |
| As Experienced | 11,000± cfs* | 16,000± cfs* | 32,000 cfs |
| With Guide Curves | 0 | 8,000 | 20,000 |
| Δ | 11,000 | 8,000 | 12,000 |
| % | -100 | -50 | -37 |
| Δ Stage | −1.5± feet | −1.1± feet | −1.7± feet |

* Contribution to First Peak

TABLE IV

RESERVOIR SYSTEM OPERATION
DURING SPRING REFILL DROUGHTS
COMPARATIVE DATA

| | April-May 1957 | April-May 1965 |
|---|---|---|
| WATER IN STORAGE (Acre-Feet) | | |
| Starting/Ending | | |
| Experienced | 147,310/659,960 | 209,550/650,290 |
| With Monthly Guide Curve | 40,660/360,410 | 60,000/384,260 |
| With Daily Guide Curve | 40,660/441,430 | 60,000/540,740 |
| CHANGE IN STORAGE (Acre-Feet) | | |
| Experienced | 512,650 | 440,740 |
| With Monthly Guide Curve | 319,750 | 324,260 |
| With Daily Guide Curve | 400,770 | 480,740 |
| MINIMUM FLOW AT BINGHAM (CFS) | | |
| Experienced | 1,330* | 1,340* |
| With Monthly Guide Curve | 2,000 | 2,000 |
| With Daily Guide Curve | 2,000 | 2,000 |

* Minimum experienced daily flow likely effected by regulation at Wyman

and weather forecasts in the basin, during high runoff periods, are inadequate to permit operating for a target flow at a downstream location and releases during high runoff were generally based on storage conditions at the reservoirs. He also noted that the mode of operation at the reservoirs was not conducive for making frequent changes in release rates, particularly any operation calling for night time gate changes where personnel safety could be at risk.

## 4. FLOOD STORAGE EFFECTIVENESS

This section presents data and discussion on the estimated magnitude of flood stage reductions that might be provided by flood control storage on selected uncontrolled tributaries and central basin intervening local areas. In the earlier 1985 Flood Hydrology study it was concluded that the Sandy and Carrabassett Rivers were large contributors, relative to watershed size, to lower main stem Kennebec River floodflows. For the four floods reviewed, i.e., December 1973, April 1979, April 1983 and June 1984, the contributions from the Sandy and Carrabassett Rivers to peaks on the lower main stem averaged an estimated 30 percent of floodflow. In the more recent 1987 flood the percent contribution from these two streams was even greater (more nearly 40 percent) because of the negligible contribution from the upper basin storage reservoirs.

In the current analysis, the Carrabassett and Sandy River component flood contributions were compared with four other central basin uncontrolled component local watershed areas. Component contributions, in percent of total, to lower main stem floodflows for the six areas are listed in table V along with their respective drainage areas. Also listed are average component contributions to flood stages in feet, which were based on the U.S. Geological Survey stage-discharge rating for the gage at North Sidney. All component contributions were based on the average for the four floods previously referenced, and does not include the latest 1987 flood which would skew the contributions somewhat higher due to the lower upper basin contributions.

Next, the estimated average potential flood stage reduction in feet was computed per 10,000 acre-feet of flood control storage in each of the respective component watersheds. Flood control needs per square mile of watershed were based on a minimum storage capability of 6 inches of runoff which is equivalent to about 318 acre-feet of storage per square mile of watershed controlled. This last step of the analysis provided quantitative information on flood stage reduction per unit storage, and also relative effectiveness of storage among the six component watersheds. For example, the flood stage reduction per unit of storage in the Sandy and Carrabassett Basins was about double that of some of the other component areas. A summary listing of results is presented in table V. No attempt was made to locate potential flood control storage sites in any of the component watersheds and thus no comparative information has been developed on cost per unit of storage in the different areas.

5. SURCHARGE STORAGE

a. General. Surcharge storage in a reservoir is generally defined as that storage volume between the crest of an uncontrolled spillway (or between the normal full pool elevation of a gated spillway with the crest gates in the normal closed position), and the maximum water surface for which the dam was designed to withstand. Maximum design water surface generally equals top of dam elevation minus a design freeboard, and often represents maximum pool levels under spillway design flood conditions. A cursory review of the surcharge storage characteristics of the three storage reservoirs: Brassua, Moosehead and Flagstaff, revealed no opportunity for any significant use of surcharge storage for added flood control regulation.

b. Brassua Lake. This project has a usable storage capacity of about 9.0 billion cubic feet (200,000 acre-feet) between a minimum pool elevation of 1043 and a maximum normal full pool elevation 1074 feet NGVD. With a surface area of about 9,000 acres and a watershed area of 716 square miles, each foot of surcharge over elevation 1074 would represent 9,000 acre-feet, equivalent to only about 0.25 inch of runoff from its watershed. Therefore, it was concluded that several feet of surcharge storage would be needed at Brassua to provide any significant additional flood control storage.

Flows from Brassua are regulated with four 6-foot diameter low level sluices (sill elevation 1034), a gated log sluice (sill elevation 1057), and fifteen 15-foot wide stoplogged sections between elevations 1065 and 1074 feet NGVD. Top elevation of the earth embankment section of the dam is 1081.5 and the concrete nonoverflow section is 1079.5 feet NGVD. In the past the owners have proposed raising the normal full pool at Brassua, by adding stoplogs, from elevation 1074 to 1076, providing about 18,000 additional acre-feet of usable storage; however, this proposal is still pending. With projects having gated spillways an amount of surcharge storage is required above normal full pool to allow time for gate operation and for the establishment of gate operating schedules based on surcharge pool level and rate of

TABLE V

KENNEBEC RIVER BASIN
COMPONENT CONTRIBUTIONS TO FLOODFLOWS
AND
FLOOD STORAGE EFFECTIVENESS

| Component | Drainage Area (sq.mi.) | Average % Contribution to Lower Main Stem Floodflows (percent) | Average Flood Stage Contribution to Lower Main Stem Floods (feet) | Flood Stage Reduction per 10,000 Acre-Feet of Flood Storage* (feet) |
|---|---|---|---|---|
| Kennebec River Local Above Forks | 322 | 8.76 | 1.7 | 0.16 |
| Dead River Local | 358 | 5.55 | 1.1 | 0.097 |
| Forks to Bingham Local | 251 | 8.33 | 1.6 | 0.20 |
| Carrabassett River | 354 | 14.31 | 2.7 | 0.24 |
| Sandy River | 514 | 16.45 | 3.1 | 0.19 |
| Sandy to Waterville Local | 538 | 9.18 | 1.8 | 0.10 |

* Flood storage based on minimum of 6 inches (318 acre-feet) per square mile of watershed controlled

rise. It was concluded that there was no opportunity for surcharge storage regulation at Brassua Lake, beyond the incidental flood control provided by existing gate regulation, particularly if the normal full pool is eventually raised 2 feet to elevation 1076 feet NGVD.

c. Moosehead Lake. Moosehead Lake has a gross usable storage capacity of about 544,000 acre-feet between elevations 1021.3 and normal full pool elevation 1029.0 feet NGVD, with discharge limitations from the lower foot of storage. With a surface area of 74,000 acres and a total drainage area of 1,268 square miles, a foot of surcharge storage represents 74,000 acre-feet of storage equivalent to 1.1 inches of runoff from its total watershed, or 2.5 inches of storage from the 558 square miles of net drainage area below Brassua. Therefore, it is concluded that a small increment of depth in Moosehead represents considerable flood control storage potential.

Moosehead has two regulating outlet locations: East and West; however, most flood regulation is done at the East Outlet. This facility is equipped with two 20-foot wide tainter gates, two 18-foot wide gated log sluices, and 17 other vertical gates, of varying types and widths, making up a total gated overflow width of about 320 feet with all gate sills at about elevation 1018.5 feet NGVD.

Historically, project operation has maintained surcharge storage levels to not over 1029.4 feet NGVD, or about 0.4 foot above normal full pool. The top of dam elevation at Moosehead is 1032.5 feet NGVD providing a minimum of only about 3 feet of freeboard above maximum historic lake levels.

It was concluded that project restraints severely limit using any significant depth of surcharge at this project, however, the appreciable amount of storage per unit depth emphasizes the importance of project gate operation and available storage utilization for overall effective operation during flood periods.

d. Flagstaff Lake. Flagstaff Lake has a usable storage capacity of about 276,000 acre-feet between elevation 1111 feet NGVD and normal full pool elevation 1146 feet NGVD. With a full pool surface area of 17,930 acres and a watershed area of 516 square miles, a foot of surcharge storage represents nearly 18,000 acre-feet of storage equivalent to about 0.65 inch of runoff. Reportedly, maximum surcharge storage utilized at the project during a flood period has been about 0.9 foot.

Flagstaff flows are regulated by two 7-foot low level sluices (invert elevation 1110) and five 20-foot wide tainter gates, sill elevation 1134.0 feet NGVD. The project has a 450-foot long spillway, crest elevation 1144 feet NGVD, equipped with 2 feet of flashboards resulting in a normal full pool level of 1146 feet NGVD. It was concluded that when pool levels exceed normal full pool the project quite rapidly becomes self-regulating and no appreciable surcharge storage could be utilized for added flood regulation without major modifications to the project's spillway.

The top of the earth embankment and the concrete nonoverflow section at Flagstaff are at elevations 1156 and 1153 feet NGVD, respectively.

## 6. MARCH/APRIL 1987 FLOOD

The most recent Kennebec flood was the result of high volume rainfall occurring on the last day of March and first day of April. The rainfall was produced by waves of low pressure moving northeasterly along a cold front creeping across New England from the west. The cold front and rainfall followed several days of daytime temperatures in the sixties. The high volume rainfall occurring under above average ripe snowpack conditions resulted in record runoff over much of the Kennebec Basin. Rainfall totals varied considerably over the basin with maximum amounts recorded in the central part of the basin in the region of Wyman Dam (Bingham). Maximums of 6 to 7 inches were experienced at the storm center with more nearly 3 inches in the regions of the upper headwater reservoirs and 4 to 5 inches in the lower basin. The resulting runoff produced new floods of record in the Kennebec Basin generally from the mouth of the Carrabassett tributary downstream throughout the middle and lower basin. Peak flows on the lower main stem Kennebec and tributaries: Sandy, Carrabassett and Sebasticook Rivers ranged from 20 to 30 percent greater than the earlier greatest flood of March 1936. Though coincident snowpack conditions during the recent rainfall produced appreciable snowmelt runoff, it was fortunate that ice had generally gone out of the rivers prior to the event, (a factor contributing to damages in 1936) and that the three upstream storage reservoirs were in a prespring runoff, drawn down state. Therefore, they completely controlled runoff from their contributing watersheds.

Computed inflows, outflows, and changes in storage at Moosehead and Flagstaff Reservoirs are shown graphically on plates 10 and 11. This event dramatically demonstrated, as was stated in the earlier 1985 report, that there is potential for major flooding on the Kennebec from watershed runoff downstream of the three large upper basin storage reservoirs. On the other hand, had the recent event occurred under conditions of near full reservoirs, such as in June 1984, it is estimated that flows in the lower Kennebec, in the vicinity of the North Sidney gage, could have been in the order of 20 percent greater, with resulting flood stages in the order of 4 feet higher. Fortunately, having full snowpack conditions under full reservoir conditions would be quite unlikely.

Because of the reservoirs the upper basin above Bingham, representing 50 percent of the watershed above Augusta, contributed only about 25 percent of the peak flow at Augusta. By comparison the intervening 1513 square miles of watershed between Bingham and Waterville, including the Sandy and Carrabassett tributaries, representing only about 30 percent of the watershed at Augusta, contributed about 60 percent of the peak floodflow at Augusta.

Flood hydrographs and component contributions to peak flows, estimated and recorded, are shown graphically on plates 10 through 12. It is noted that much of the 1987 flood analysis was based on provisional postflood USGS data subject to revision prior to publication. Also an indepth, more authoritative hydrologic report, is being prepared by the Maine U.S. Geological Survey and will be available for future reference.

In analyzing the 1987 flood, the local contribution hydrograph between the Forks and Bingham gages was computed by lagging the Forks hydrograph 1 hour and subtracting from the Bingham data. Component contributions at North Sidney were computed by lag/averaging the Bingham hydrograph 16/7 hours and lagging the Carrabassett and Sandy River hydrographs 12 hours.

## 7. SUMMARY

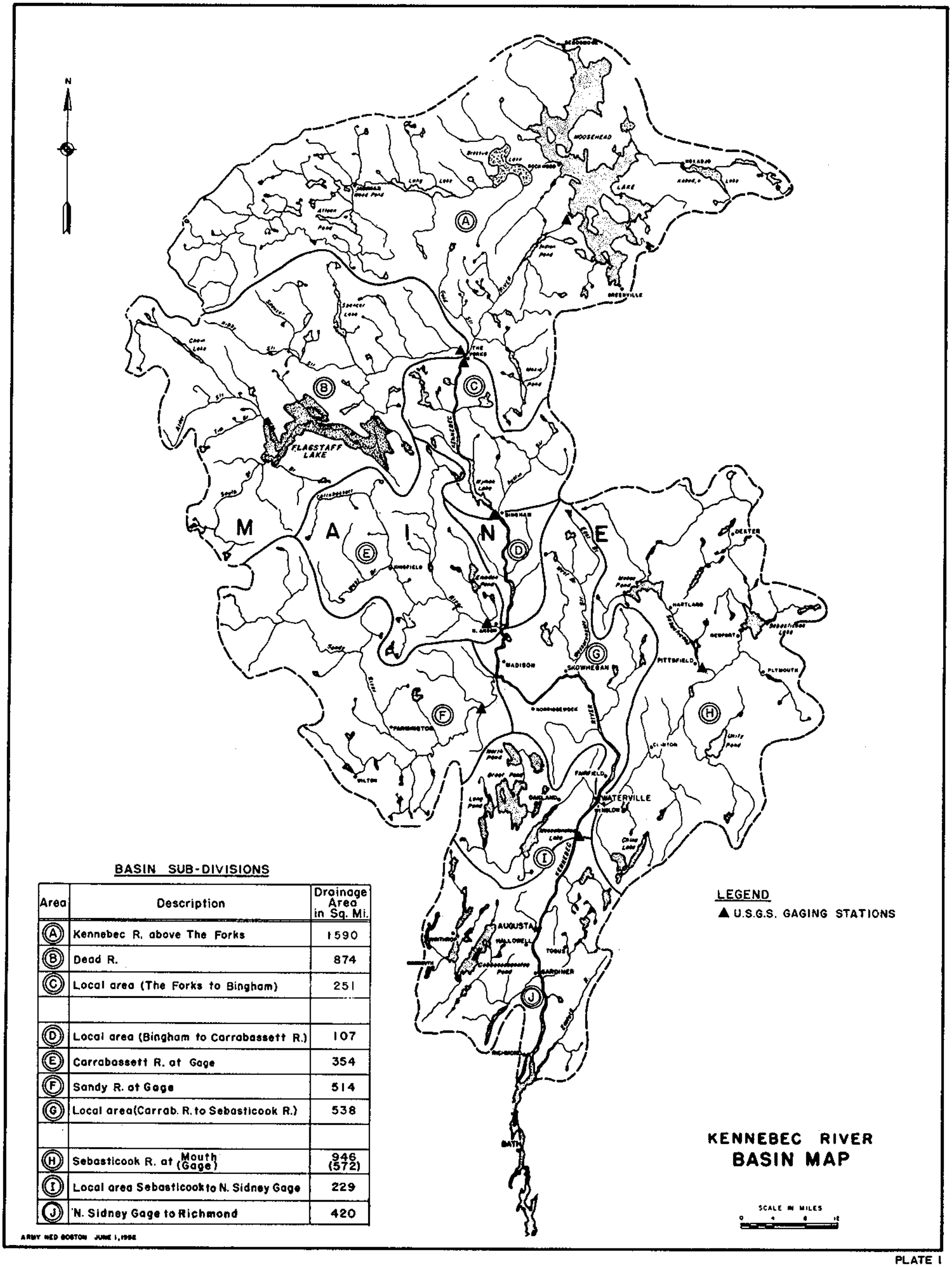
All season reservoir regulation guide curves were developed by trial through multiyear sequential hydrologic system simulations. The objective was to maximize reservoir storage availability for incidental flood control while not adversely impacting hydropower capability. Simulations, using the developed guide curves, indicated that they would result in little change in downstream flow regime but provide significantly greater reservoir storage availability. Storage capacity of 570,000 acre-feet, equivalent to 6 inches of flood runoff, would be available about 65 percent of the time as compared with less than 40 percent under actual operations. Guide curve operation would likely minimize spillage during nonspring refill floods such as the December 1973 event, but would not eliminate all spillage during critical spring refill season floods such as April 1983 and June 1984. Because spring refill is the most critical flood season, spring season (April and May) guide curves were explored that might aid orderly spring refill, minimize potential for premature spring refill, while not impacting storage capability during drought years.

In applying the guide curves to past flood events it was found impossible in most instances to prevent spillage. Average April to May runoff in the upper Kennebec is about 11 inches, or equivalent to total usable reservoir storage; therefore, when abnormal spring runoff, as high as 17 inches, occurs then spillage is inevitable. Therefore, secondary guidance was added to the guide curves in an effort to modify peak rates of spillage when spillage was eminent. Applying the guidance to the experienced April 1979, April 1983 and June 1984 flood events indicated potential reductions of about 30 percent in peak rates of spillage.

Cursory analyses were made of the relative effectiveness of flood control storage in various presently uncontrolled subwatersheds upstream of Waterville, Maine. Resulting average main stem flood stage reduction per 100,000 acre-feet of storage varied from about 1.0 to 2.5 feet for different subwatersheds with maximum effectiveness indicated for the Carrabassett tributary.

A review of surcharge storage characteristics at the three storage reservoirs: Brassua, Moosehead and Flagstaff, revealed no opportunity for any significant added use of surcharge storage for flood control. An amount of surcharge storage is required for gate operation and for the establishment of gate operation schedules, which result in some incidental modification between peak inflow and outflow. The large amount of surcharge storage, per unit depth at these large lake areas, emphasizes the importance of gate operating schedules and available storage utilization for effective project operation during floods.

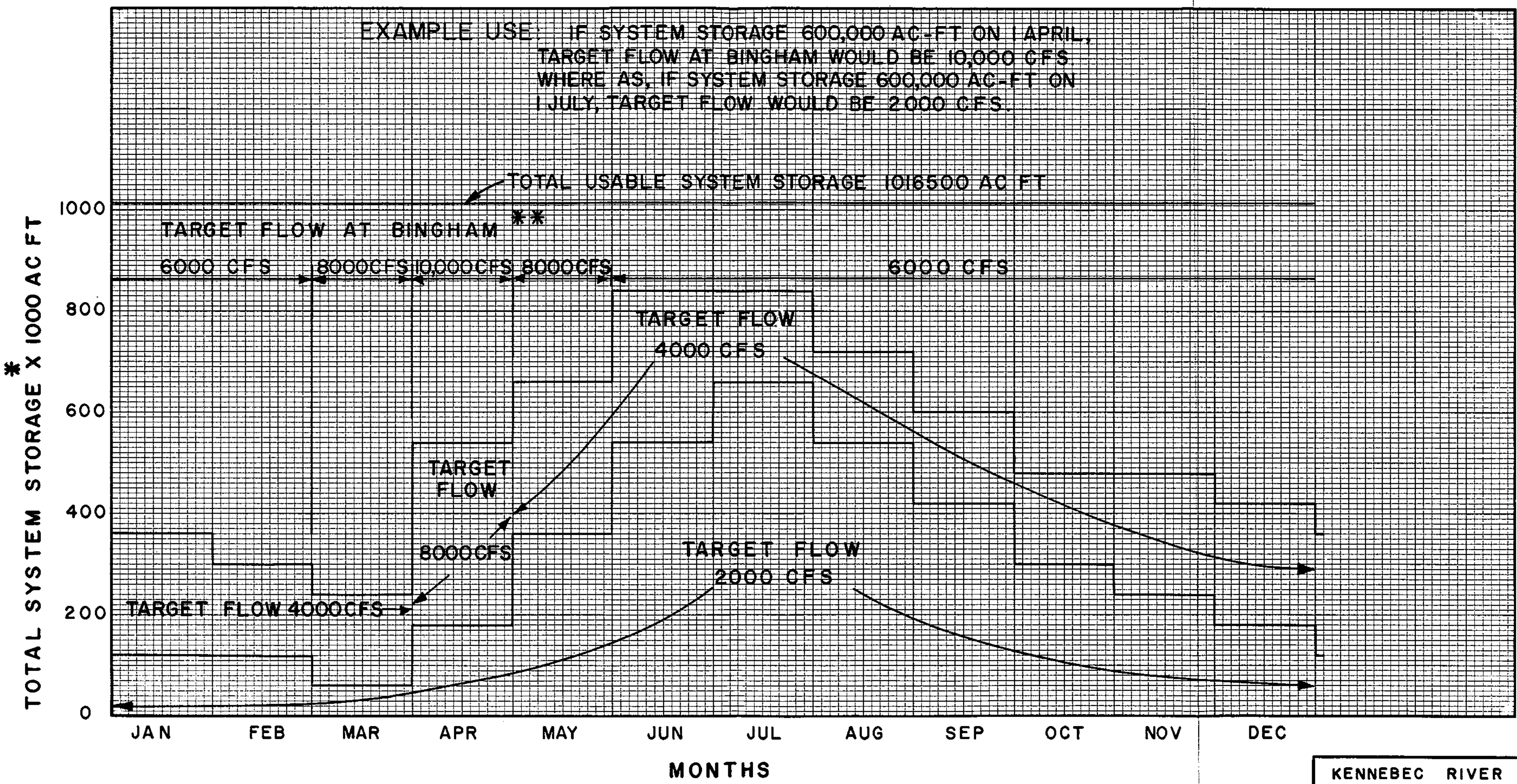
The most recent major Kennebec River flood of March/April 1987 was analyzed, and component contributions determined, using provisional streamflow and rainfall records. This was a new flood of record generally throughout the mid to lower Kennebec Basin and, with the upper basin reservoirs completely controlling the runoff from their contributing watersheds, dramatically demonstrated the flood producing potential of runoff from the uncontrolled downstream watersheds.




BASIN SUB-DIVISIONS

| Area | Description | Drainage Area in Sq. Mi. |
|---|---|---|
| A | Kennebec R. above The Forks | 1590 |
| B | Dead R. | 874 |
| C | Local area (The Forks to Bingham) | 251 |
| | | |
| D | Local area (Bingham to Carrabassett R.) | 107 |
| E | Carrabassett R. at Gage | 354 |
| F | Sandy R. at Gage | 514 |
| G | Local area (Carrab. R. to Sebasticook R.) | 538 |
| | | |
| H | Sebasticook R. at Mouth (Gage) | 946 (572) |
| I | Local area Sebasticook to N. Sidney Gage | 229 |
| J | N. Sidney Gage to Richmond | 420 |

PLATE I




* SYSTEM STORAGE REFERS TO THE THREE LAKES BRASSUA, MOOSEHEAD AND FLAGSTAFF

** TARGET FLOWS ARE ON KENNEBEC RIVER AT BINGHAM

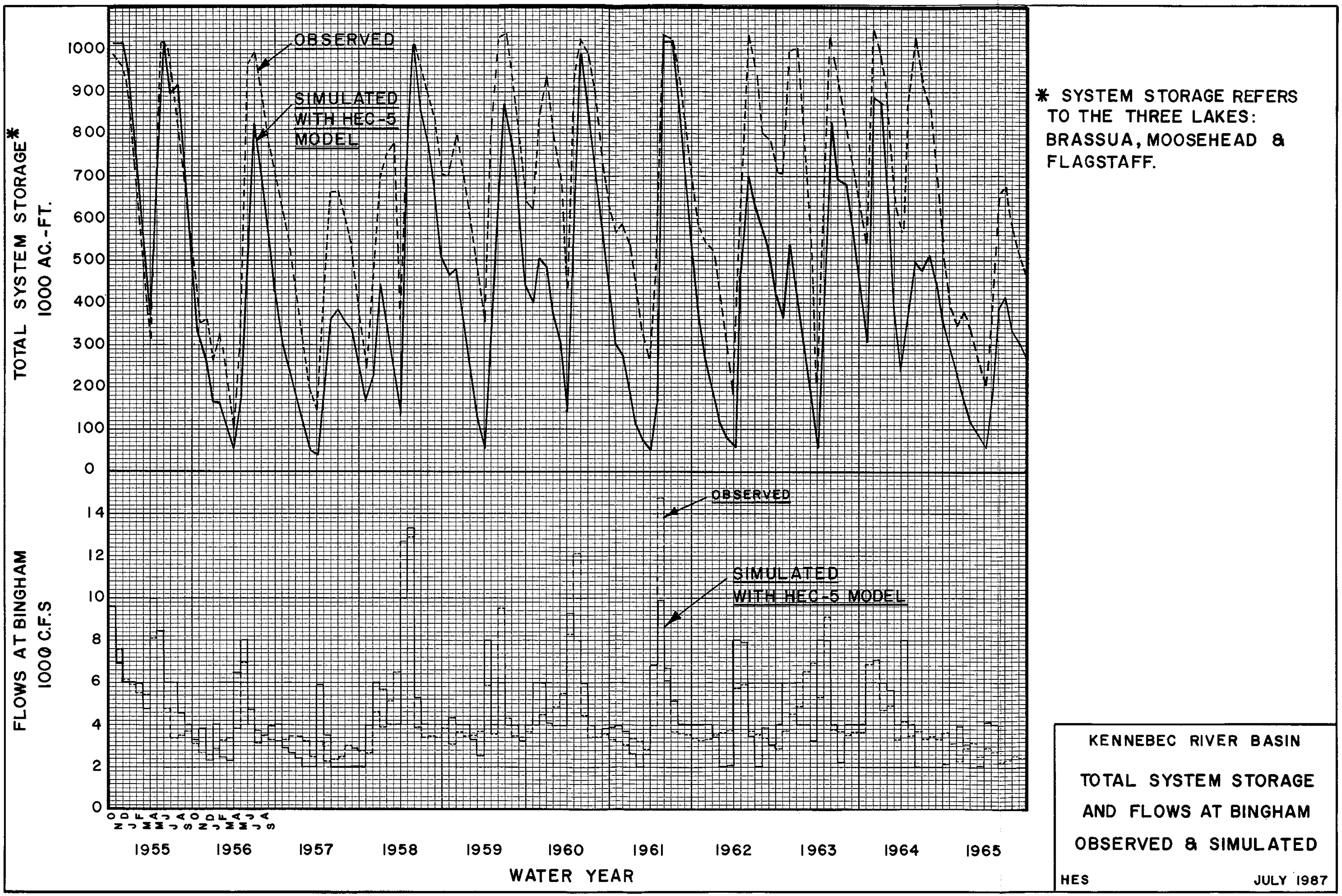
KENNEBEC RIVER BASIN

**MONTHLY GUIDE CURVES**

FOR LAKE REGULATION

HES JULY 1987

PLATE 2

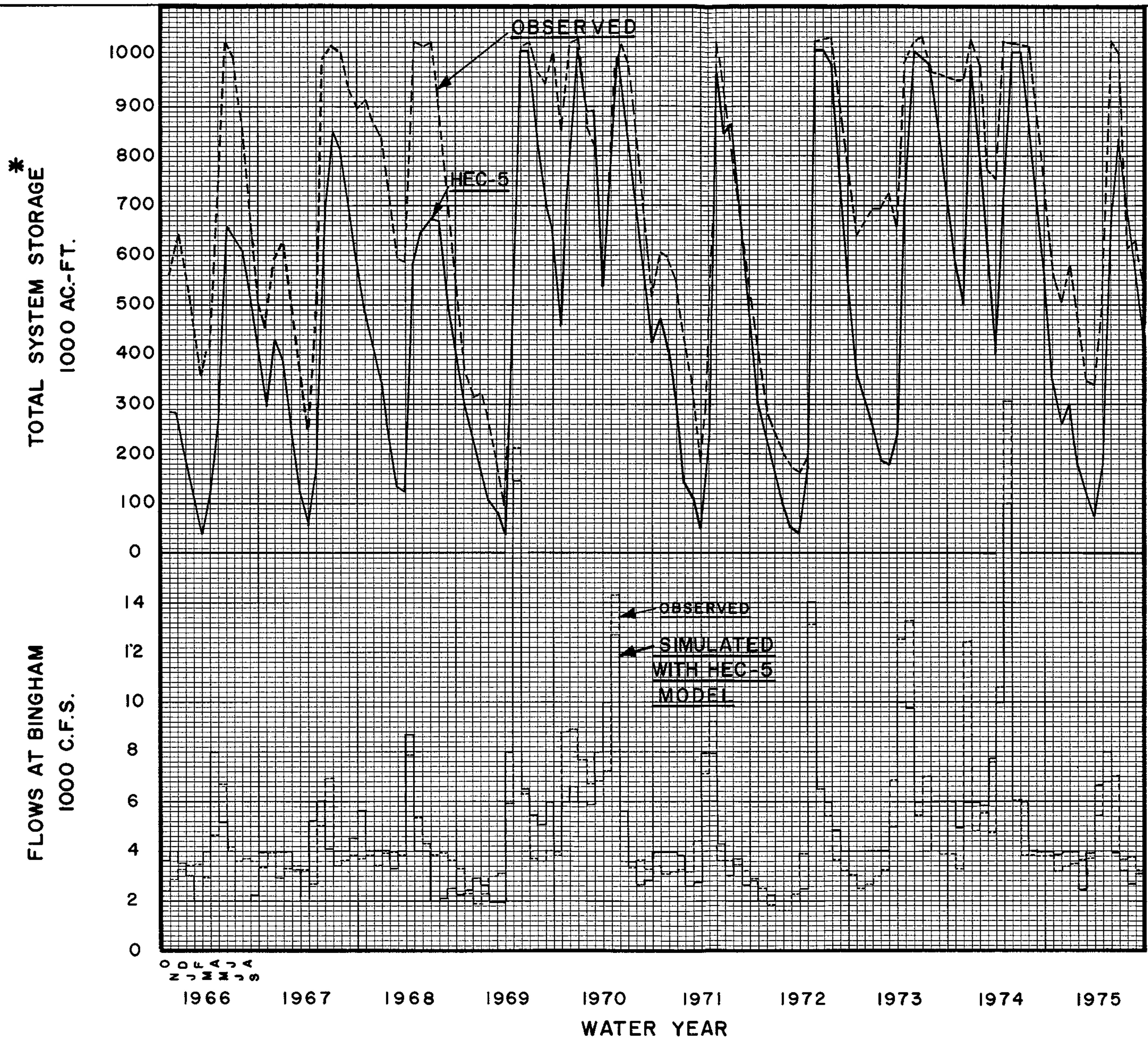



KENNEBEC RIVER BASIN

TOTAL SYSTEM STORAGE AND FLOWS AT BINGHAM OBSERVED & SIMULATED

HES JULY 1987

PLATE 3



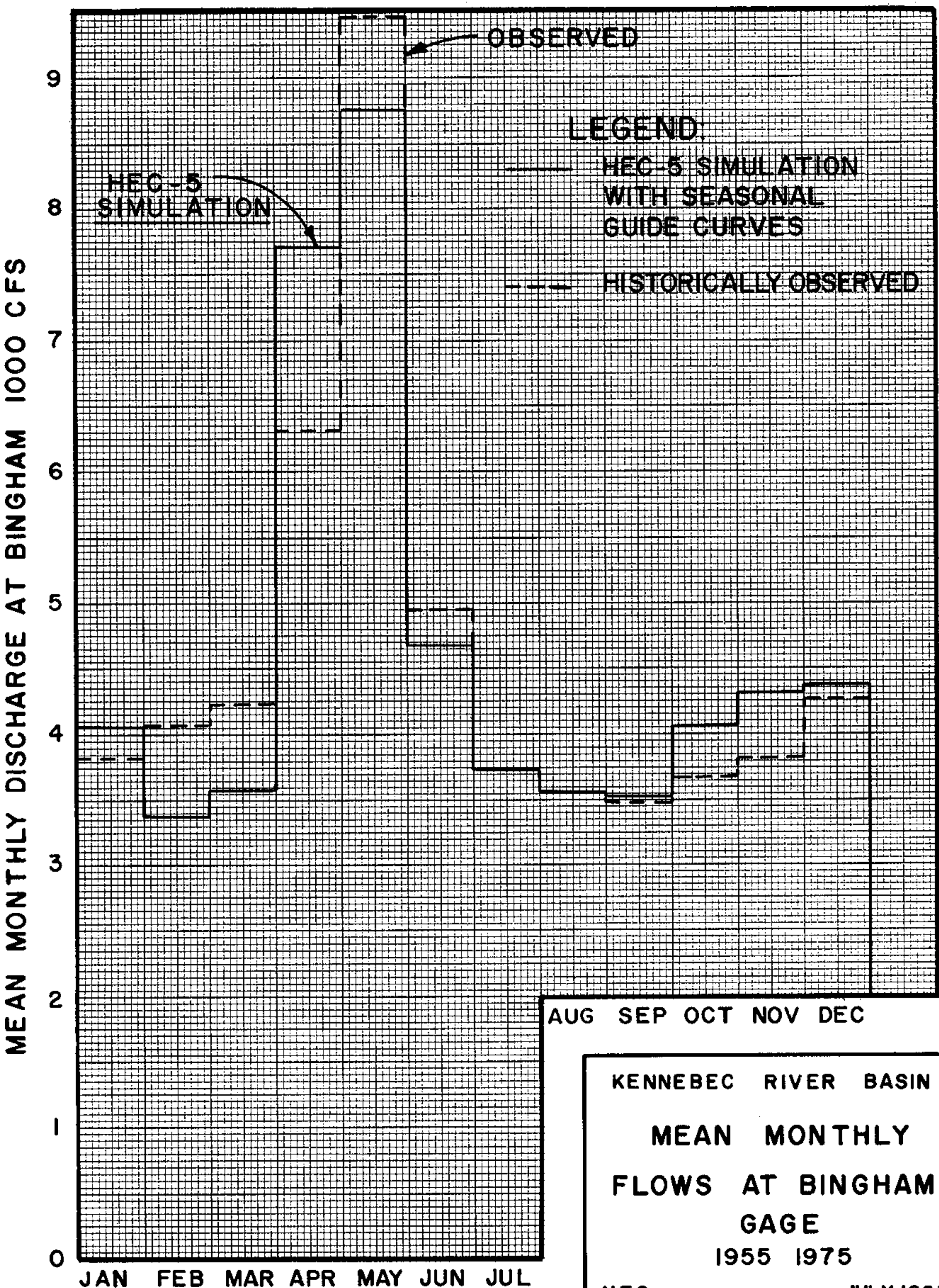

* SYSTEM STORAGE REFERS TO THE THREE LAKES: BRASSUA, MOOSEHEAD & FLAGSTAFF.

KENNEBEC RIVER BASIN

TOTAL SYSTEM STORAGE AND FLOWS AT BINGHAM OBSERVED & SIMULATED

HES JULY 1987

PLATE 4



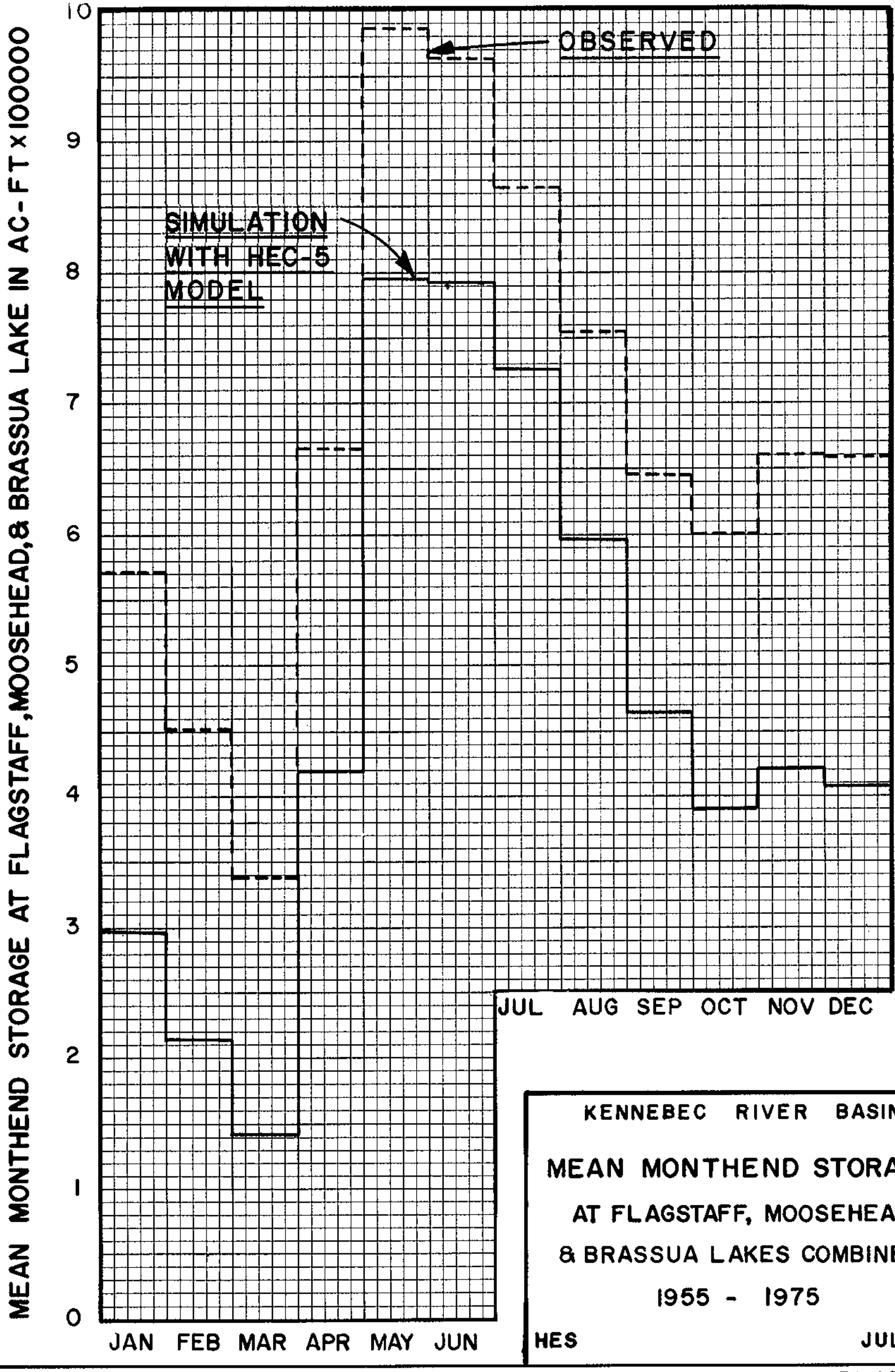

KENNEBEC RIVER BASIN

MEAN MONTHLY FLOWS AT BINGHAM GAGE

1955 1975

HES JULY 1987

PLATE 5

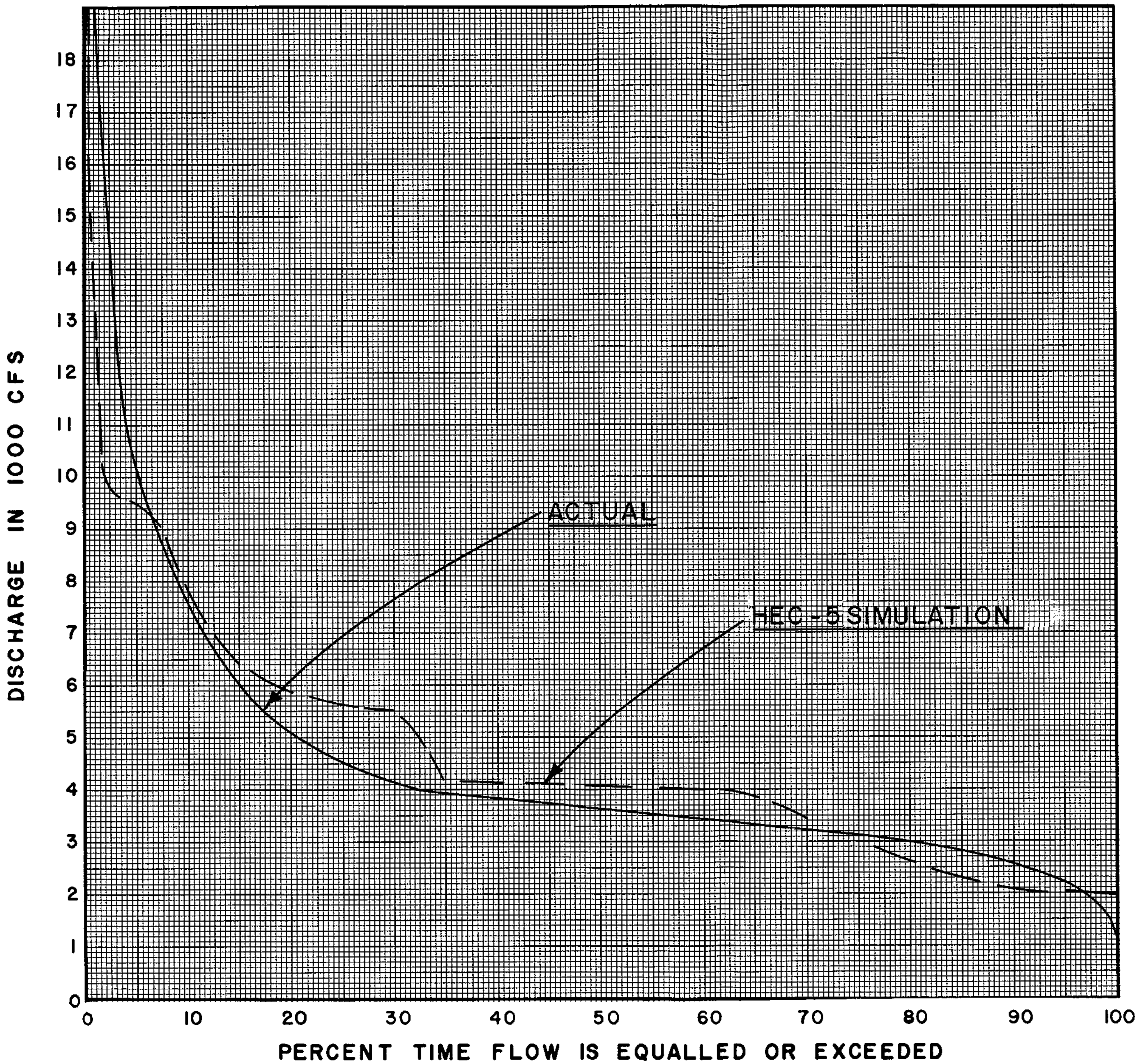



KENNEBEC RIVER BASIN

MEAN MONTHEND STORAGE
AT FLAGSTAFF, MOOSEHEAD,
& BRASSUA LAKES COMBINED
1955 - 1975

HES JULY 87

PLATE 6




NOTES:

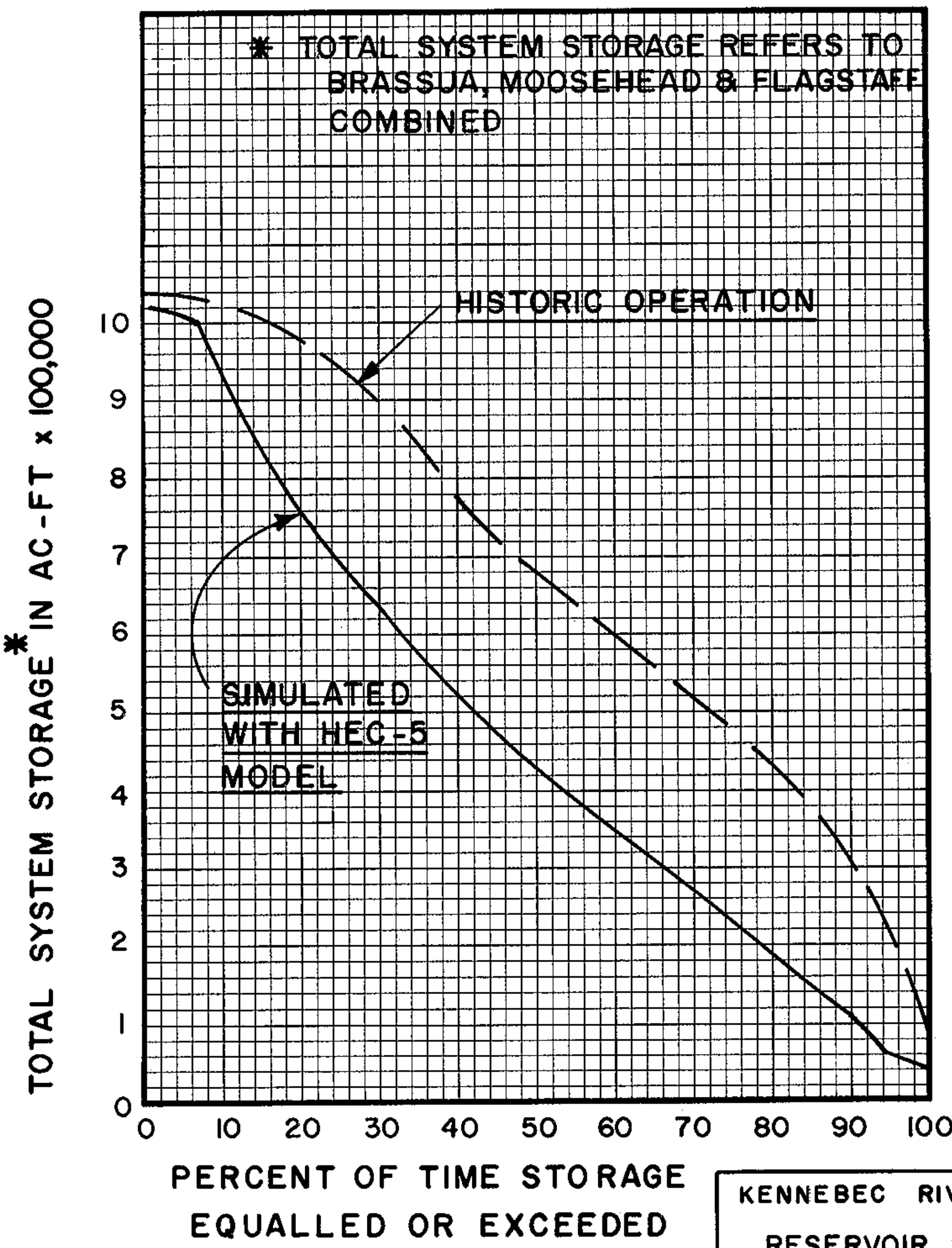
D.A. = 2715 SQ. MI.
PERIOD OF ANALYSIS
1955 - 1975

KENNEBEC RIVER BASIN

FLOW DURATION CURVES AT BINGHAM

HES JULY 1987

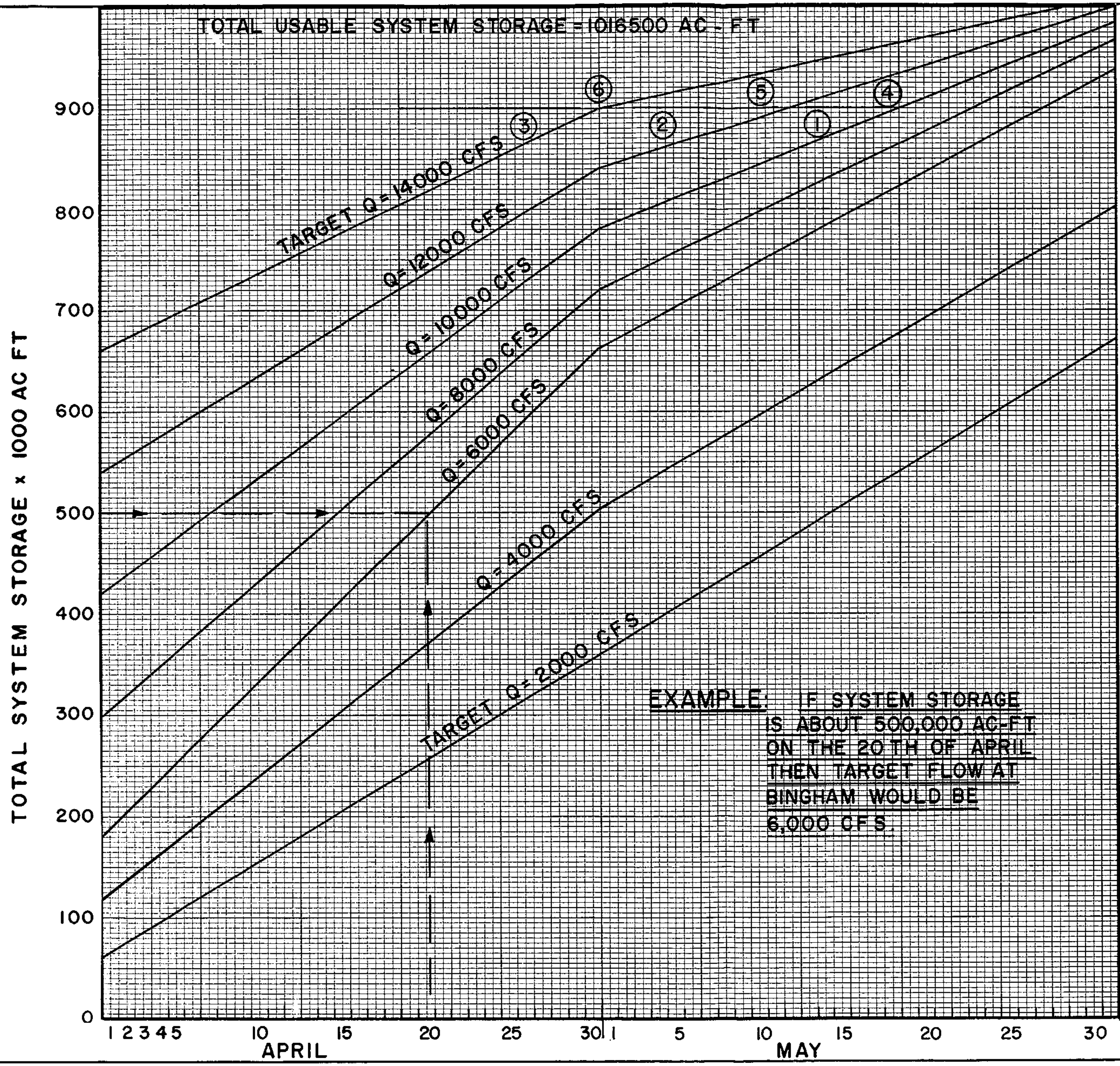
PLATE 7




KENNEBEC RIVER BASIN
RESERVOIR SYSTEM

STORAGE - DURATION CURVES

1955-75 TEST PERIOD




## NOTES:

STOR. < 900,000

1. TARGET "Q" < 12,000
   NO MIN. RELEASE RATE
2. TARGET "Q" 12 - 14 K
   MIN. RELEASE => 8 K
3. TARGET "Q" > 14,000
   MIN. RELEASE => 10 K

STOR. > 900,000

4. TARGET "Q" < 12,000
   MIN. RELEASE = > 1/2 IN FLOW
5. TARGET "Q" 12 - 14 K
   MIN. RELEASE => 1/2 IN FLOW
   OR 8 K
6. TARGET "Q" > 14 K
   MIN. RELEASE => 1/2 IN FLOW
   OR 10 K

## LEGEND

< LESS THAN

> GREATER THAN

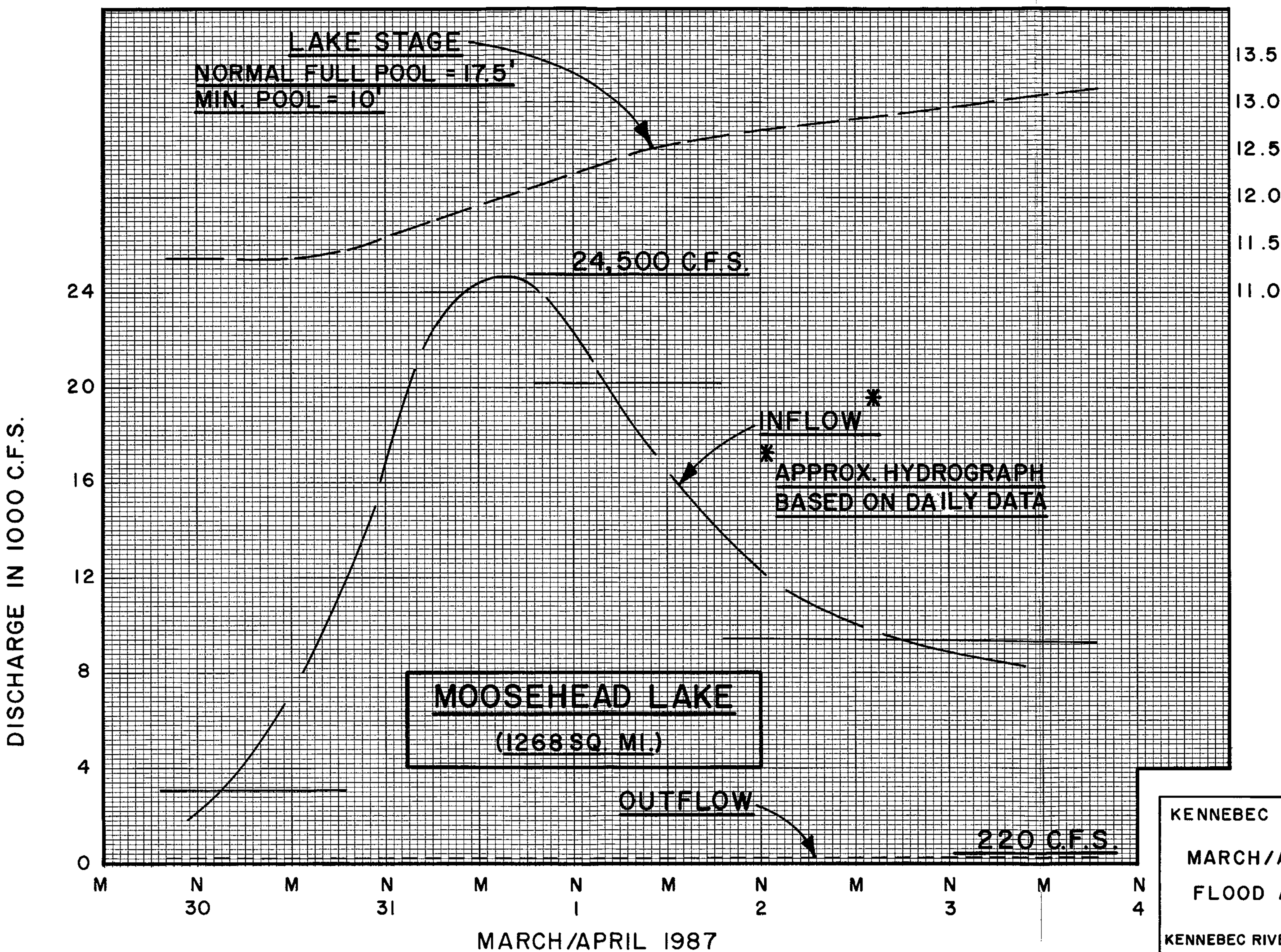
=> NOT LESS THAN

KENNEBEC RIVER BASIN

**RESERVOIR STORAGE SPRING REFILL GUIDE CURVES**

HES JULY 1987

PLATE 9

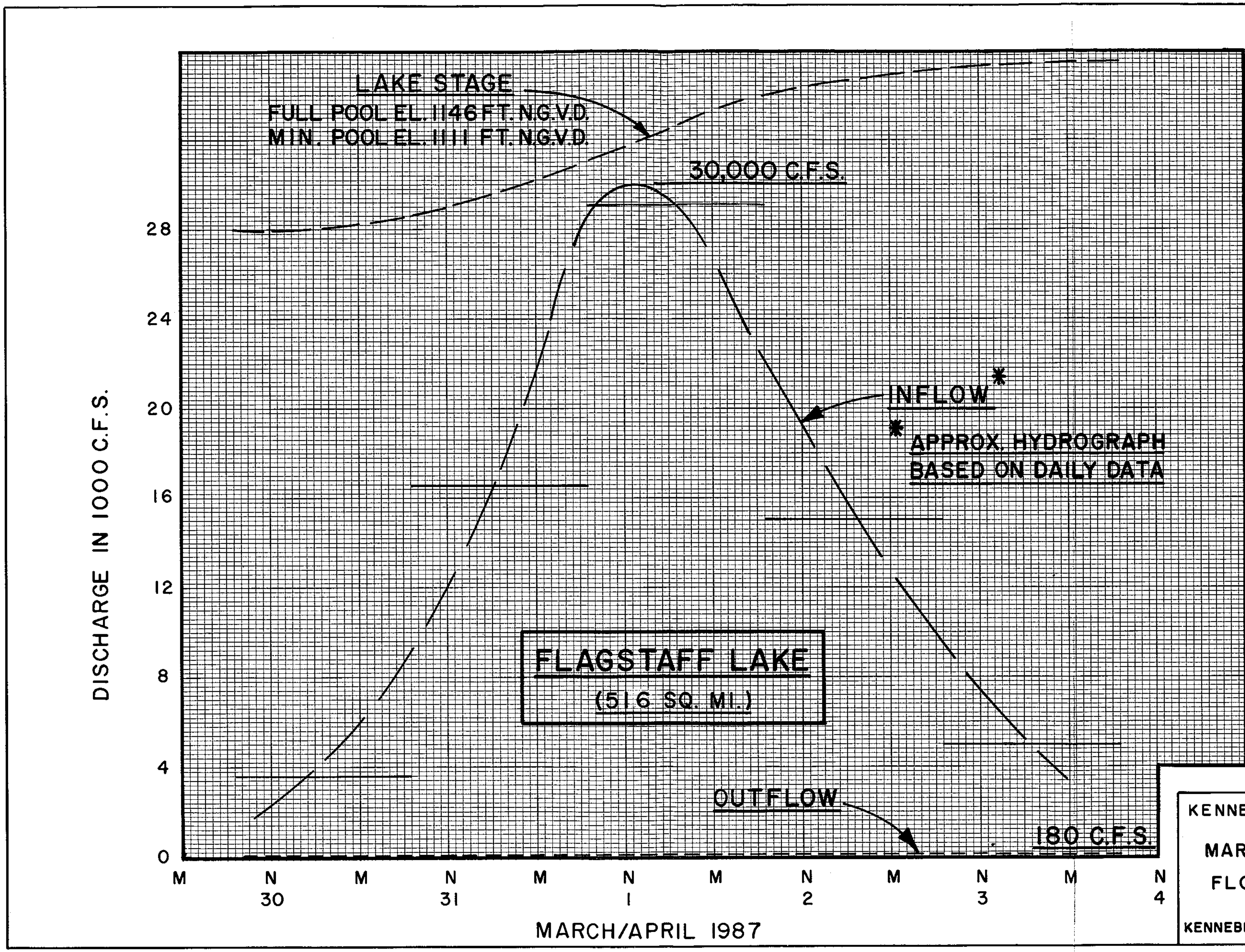



KENNEBEC RIVER BASIN

MARCH/APRIL 1987
FLOOD ANALYSIS

KENNEBEC RIVER MAINE

PLATE 10

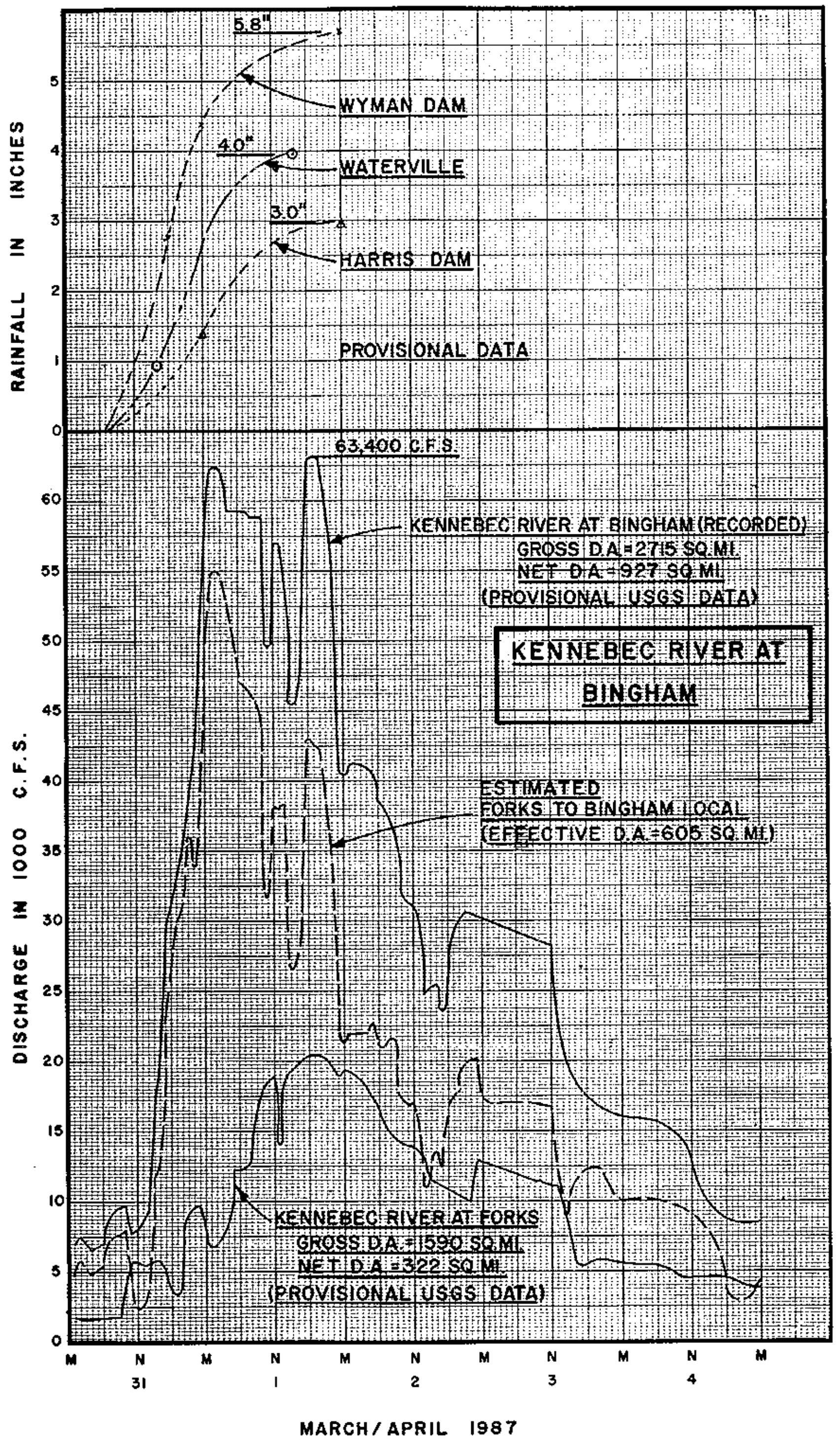


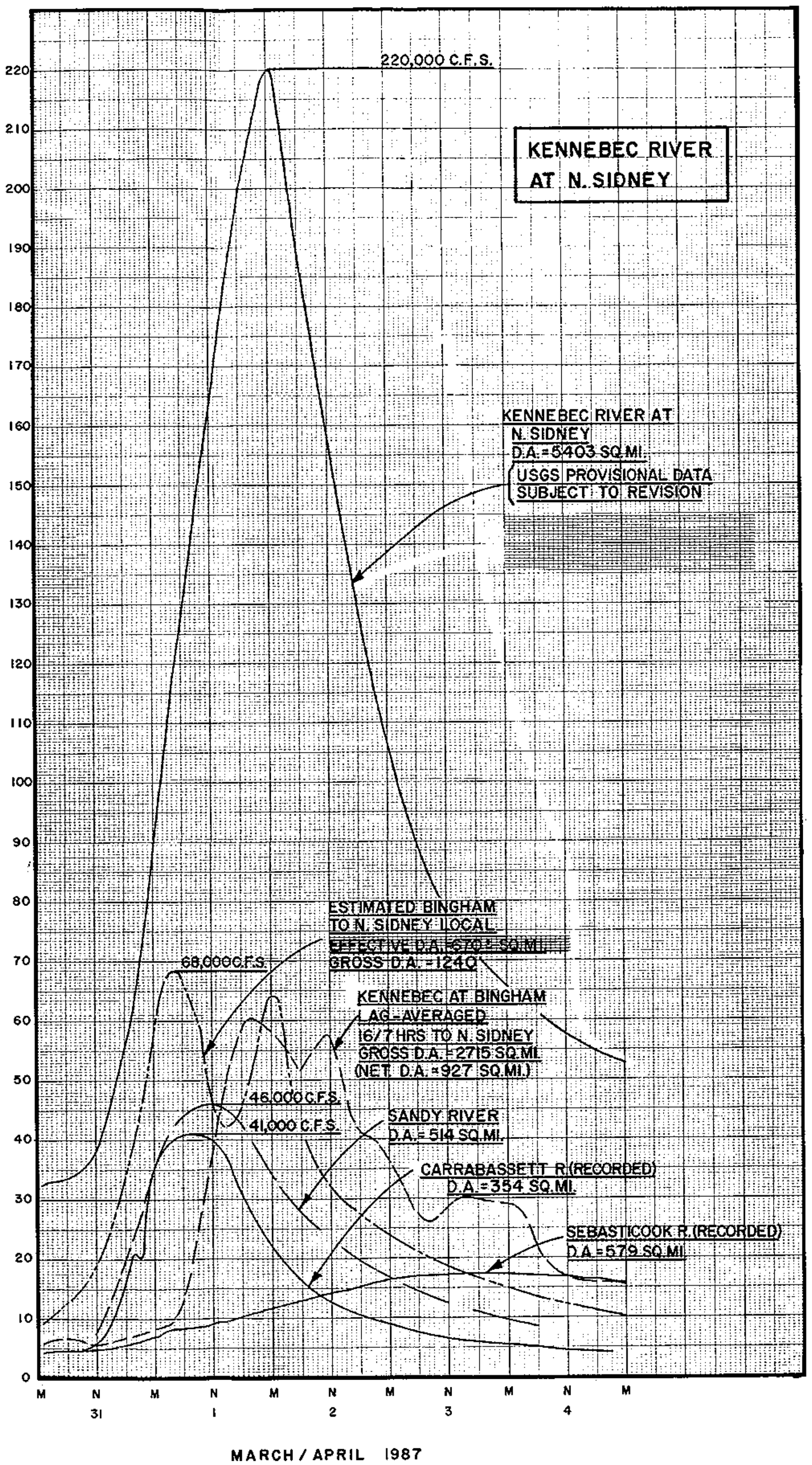

KENNEBEC RIVER BASIN

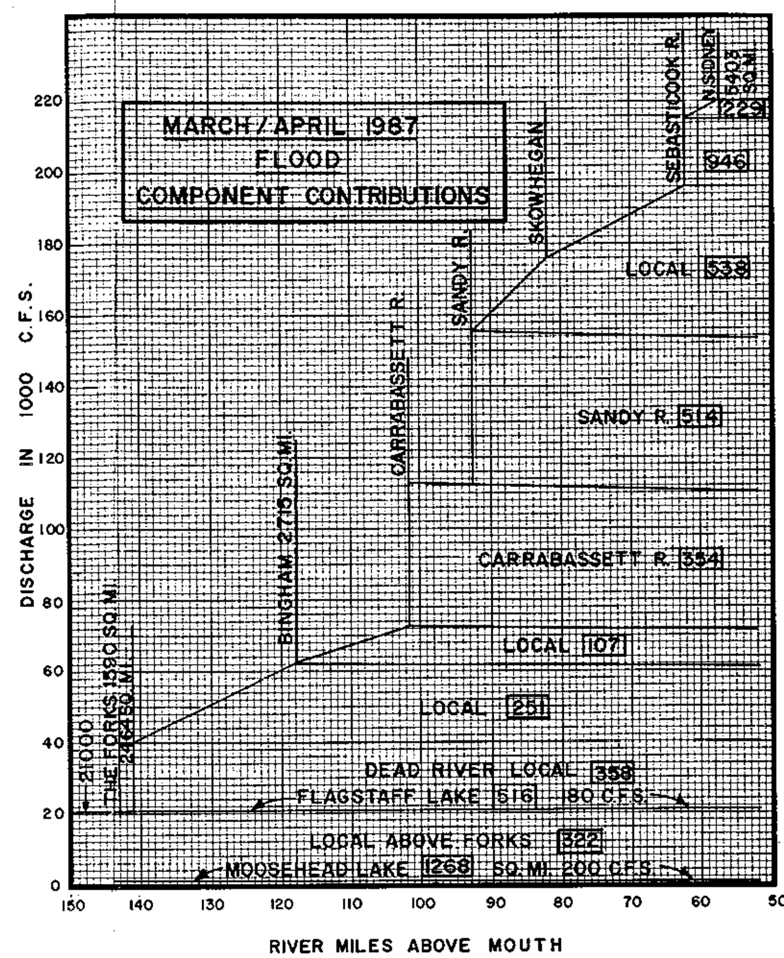
MARCH/APRIL 1987
FLOOD ANALYSIS

KENNEBEC RIVER — MAINE

PLATE 11




DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

KENNEBEC RIVER BASIN

FLOOD ANALYSIS

**MARCH - APRIL 1987**

# A P P E N D I X

## HEC-5 COMPUTER
## INPUT-OUTPUT

## BRASSUA, MOOSEHEAD &
## FLAGSTAFF SYSTEM SIMULATION
## USING SEASONAL GUIDE CURVES

SEPTEMBER 1987

```
1
            5 SIMULATION OF FLOOD CONTROL
              AND CONSERVATION SYSTEMS

        APRIL 1982 VERSION   (UPDATED 14 FEB 83)

        MAX DIMENSION LIMITS ARE CURRENTLY SET AT   35  RESERVOIRS AND   55  CONTROL POINTS


     *INPUT LISTING FROM HEC5A

         TO SUPPRESS LISTING, INSERT NCLIST CARD INTO INPUT DECK AT DESIRED POINT


     T1 KENNEBEC RIVER BASIN STUDY
     T2 BRASSUA MOOSEHEAD & FLAGGSTAFF OPERATING
     T3 FOR FRM YIELD AT BINGHAM
     J1       0      10       6       5       6       2       0      10
     J2                              16
     J3       4
     JZ    1.09    1.11    1.10    2.09    2.11    2.10    3.11    3.10    4.24    4.04

     RL       1  196500       0   47800  123500  160000  196500  196500
     RL       1       1       0       0       0       0       0       0       0       0
     RL                                       0       0       0       0       0       0
     RL       2       1       0       0   45000   35000   15000    7000    7000    7000
     RL                                   15000   60000  110000  140000  110000   80000
     RL       3       1       0       0   57000   49000   34000   22000   20000   15000
     RL                                   42000   88000  133000  147000  117000   87000
     RL       4       1       0       0   76000   72000   57000   41000   35000  225000
     RL                                   76000  114000  159000  166000  136000  106000
     RL       5       1       0       0   95000   95000   80000   60000   50000   30000
     RL                                  110000  140000  185000  185000  155000  125000
     RL       6       1       0       0  196500  196500  196500  196500  196500  196500
     RL                                  196500  196500  196500  196500  196500  196500
     RO       1       2
     RS       4       0    7270  120800  196500
     RQ       4    8000    8000    8000    8000
     RE       4    1030    1040    1050    1073

     CP       1    2000     142     142
     ID BRASSUA
     C1       1     .26
     RT       1       2

     RL       2  544000       0   70800  206000  408800  544000  544000
     RL       1       2       0       0       0       0       0       0       0       0
     RL                                       0       0       0       0       0       0
     RL       2       2       0          170000  135000  110000   75000   75000   35000
     RL                                  110000  200000  285000  345000  285000  225000
     RL       3       2       0       0  187000  173000  143000  118000   99000   67000
     RL                                  163000  251000  341000  367000  307000  247000
     RL       4       2       0       0  221000  214000  184000  159000  132000  101000
     RL                                  224000  298000  388000  401000  341000  281000
     RL       5       2       0       0  255000  255000  225000  200000  165000  135000
     RL                                  285000  345000  435000  435000  375000  315000
     RL       6       2       0       0  544000  544000  544000  544000  544000  544000
     RL                                  544000  544000  544000  544000  544000  544000
     RO       1       4
     RS       4       0   70800  408800  544000
     RQ       4   20000   20000   20000   20000
```

```
RE       4    1000      1010      1020      1029

CP       2    8000       250       250
IDMOOSEHEAD
C1       2     .21
RT       2       4

RL       3  276000         0     82100    137500    220600    276000    276000
RL       1       3         0         0         0         0         0         0         0         0
RL                                             0         0         0         0         0         0
RL       2       3         0         0     85000     70000     55000     38000     38000     18000
RL                                         55000    100000    145000    175000    145000    115000
RL       3       3         0         0    102000     92000     77000     62000     53000     37000
RL                                         85000    125000    170000    192000    162000    132000
RL       4       3         0         0    116000    110000     96000     81000     69000     56000
RL                                        117000    150000    195000    206000    176000    146000
RL       5       3         0         0    130000    130000    115000    100000     85000     75000
RL                                        145000    175000    220000    220000    190000    160000
RL       6       3         0         0    276000    276000    276000    276000    276000    276000
RL                                        276000    276000    276000    276000    276000    276000
RO       1       4
RS       4       0     82100    220600    276000
RQ       4    5000      5000      5000      5000
RE       4    1080      1100      1120      1144

CP       3    8000       104       104
IDFLAGGSTAFF
C1       3     .19
RT       3       4

CP       4    8000      4000      2000
IDBINGHAM GAGE
C1       4     .34
RT       4
CC      12    6000      6000      6000      6000      6000      8000     10000      8000      6000
CC    6000    6000      6000
OM    4000    4000      4000      4000      4000      4000      8000      4000      4000      4000
OM    4000    4000
ED
BF       0     412         0          051060100         0       720
ZW A=KENNEBEC F=BASE
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| IN | 1JUNE1951 | | 2120 | 2880 | 1331 | 2208 | 1477 | 7849 | 4452 | 2366 |
| IN | 2114 | 1160 | 14005 | 11091 | 6123 | 152 | 114 | 226 | 870 | 1034 |
| IN | 2992 | 2504 | 2442 | 10660 | 20040 | 9092 | 1978 | 1254 | 641 | 695 |
| IN | 1931 | 5139 | 6424 | 1801 | 2102 | 3382 | 17070 | 13520 | 8536 | 3838 |
| IN | 4889 | 9770 | 9598 | 6947 | 4745 | 2295 | 2426 | 2365 | 16370 | 12730 |
| IN | 3999 | 6254 | 1710 | 180 | 196 | 2614 | 903 | 3935 | 1581 | 1279 |
| IN | 8568 | 17170 | 5227 | 1887 | 1010 | 1806 | 2020 | 1891 | 1680 | 1357 |
| IN | 868 | 1846 | 8286 | 6449 | 2389 | 1571 | 1630 | 626 | 576 | 5069 |
| IN | 9464 | 4502 | 1978 | 2139 | 20530 | 17550 | 2525 | 2798 | 2211 | 1280 |
| IN | 3338 | 4406 | 2029 | 2069 | 1315 | 1328 | 14110 | 7462 | 10040 | 2413 |
| IN | 1393 | 295 | 3392 | .7821 | 5591 | 2399 | 2743 | 1490 | 17300 | 13900 |
| IN | 3938 | 1686 | 808 | 1687 | 1937 | 3518 | 2387 | 1452 | 1290 | 2335 |
| IN | 9188 | 23440 | 6160 | 2485 | 1037 | 1761 | 1216 | 2328 | 2893 | 2151 |
| IN | 1307 | 1695 | 15000 | 11600 | 2148 | 1160 | 3139 | 1201 | 3134 | 8843 |
| IN | 4336 | 1575 | 1824 | 1453 | 12910 | 15820 | 1696 | 2110 | 2100 | 2005 |
| IN | 1754 | 15800 | 5755 | 2003 | 1050 | 1943 | 10500 | 5752 | 1635 | 2646 |
| IN | 923 | 552 | 1012 | 2179 | 2928 | 1980 | 1508 | 1611 | 6131 | 7322 |
| IN | 2486 | 858 | 1321 | 1401 | 3900 | 4085 | 1955 | 1743 | 722 | 5316 |
| IN | 10700 | 11320 | 3644 | 1442 | 664 | 503 | 2069 | 6203 | 3219 | 1789 |
| IN | 1048 | 899 | 7293 | 13850 | 7304 | 3412 | 2274 | 2752 | 3677 | 2810 |
| IN | 2950 | 2008 | 1841 | 3823 | 16290 | 5236 | 4421 | 1961 | 63 | 483 |
| IN | 344 | 1419 | 1959 | 1566 | 1512 | 1269 | 13120 | 29860 | 6548 | 2808 |
| IN | 3002 | 4713 | 1005 | 12650 | 9176 | 3989 | 5871 | 2244 | 14420 | 16270 |
| IN | 2859 | 1235 | 172 | 722 | 4857 | 2902 | 2408 | 1247 | 1969 | 1782 |
| IN | 11110 | 20190 | 2040 | 716 | 1250 | 518 | 832 | 884 | 1218 | 585 |
| IN | 1113 | 1867 | 4865 | 27670 | 6590 | 5422 | 1177 | 291 | 1289 | 2950 |
| IN | 3284 | 2911 | 3840 | 6061 | 18840 | 13780 | 5685 | 5821 | 3922 | 3691 |
| IN | 3803 | 3553 | 13920 | 3446 | 1829 | 4528 | 16100 | 22070 | 6011 | 3847 |
| IN | 1565 | 1087 | 640 | 2458 | 4650 | 1948 | 1382 | 3469 | 8411 | 16330 |
| IN | 6454 | 1083 | 257 | 1008 | 2410 | 3175 | 2800 | 2000 | 3420 | 8120 |
| IN | 19050 | 10900 | 2190 | 7740 | 7080 | 1790 | 6730 | 4110 | 3610 | 1080 |
| IN | 800 | 24400 | 14200 | 3510 | 6800 | 1510 | 2410 | 4050 | 16400 | 6890 |
| IN | 3420 | 12200 | 3240 | 2800 | 15000 | 13600 | 4000 | 1190 | 610 | 410 |
| IN | 605 | 580 | 370 | 2090 | 1260 | 12000 | 17400 | 11800 | 4900 | 1390 |
| IN | 960 | 1330 | 3380 | 4220 | 2600 | 1100 | 500 | 2220 | 11500 | 4950 |
| IN | 1370 | 1050 | 1000 | 820 | 2470 | 2710 | 2730 | 830 | 8490 | 2580 |
| IN | 5050 | 4700 | 3690 | 1770 | 2000 | 3840 | 6650 | 5010 | 2560 | 2320 |
| IN | 1560 | 2210 | 16700 | 7260 | 2610 | 825 | 1030 | 970 | 875 | 4500 |
| IN | 2260 | 3090 | 6550 | 9860 | 21200 | 10700 | 4100 | 1960 | 1120 | 930 |
| IN | 1150 | 10900 | 9590 | 2980 | 2870 | 5100 | 22100 | 13500 | 11600 | 4030 |
| IN | 940 | 500 | 690 | 1530 | 1830 | 1510 | 3190 | 5440 | 9660 | 4600 |
| IN | 2510 | 1750 | 720 | 1850 | | | | | | |

1
*USERS USER DESIGNED OUTPUT

SUMMARY BY PERIOD FLOOD= 1

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOC NO= | | | | | 1. | 1. | 1. | 2. | 2. | 2. | 3. | 3. | 4. | 4. |
| CODE= | | | | | 1.090 | 1.110 | 1.100 | 2.090 | 2.110 | 2.100 | 3.110 | 3.100 | 4.240 | 4.343 |
| | | | | | BRASSUA | BRASSUA | BRASSUA | MOOSEHEAD | MOOSEHEAD | MOOSEHEAD | FLAGGSTAF | FLAGGSTAF | BINGHAM G | BINGHAM G |
| PER | DY | MO | YR | DW | INFLOW | EOP STOR | OUTFLOW | INFLOW | EOP STOR | OUTFLOW | ECP STOR | OUTFLOW | LOCAL IN | FLOW REG |
| 1 | 1 | 6 | 51 | 1 | 551.20 | 185000.00 | 744.46 | 1189.66 | 435000.00 | 3021.44 | 220000.00 | 1343.90 | 720.80 | 5086.14 |
| 2 | 1 | 7 | 51 | 1 | 748.80 | 185000.11 | 748.80 | 1353.60 | 386219.04 | 2146.93 | 199513.72 | 873.87 | 979.20 | 4000.00 |
| 3 | 1 | 8 | 51 | 1 | 346.06 | 137512.72 | 1118.36 | 1397.87 | 307359.38 | 2680.38 | 162147.98 | 867.08 | 452.54 | 4000.00 |
| 4 | 1 | 9 | 51 | 1 | 574.08 | 94482.64 | 1297.21 | 1760.89 | 266057.34 | 2454.99 | 139847.14 | 794.29 | 750.72 | 4000.00 |
| 5 | 1 | 10 | 51 | 1 | 384.32 | 66514.52 | 838.87 | 1149.04 | 181868.55 | 2518.22 | 96668.55 | 979.60 | 502.18 | 4000.00 |
| 6 | 1 | 11 | 51 | 1 | 2040.74 | 95000.00 | 1562.03 | 3210.32 | 255000.00 | 1981.33 | 130000.00 | 934.53 | 2668.66 | 5584.51 |
| 7 | 1 | 12 | 51 | 1 | 1157.52 | 80001.16 | 1401.45 | 2336.37 | 225000.00 | 2824.27 | 115000.00 | 1089.83 | 1513.68 | 5427.77 |
| 8 | 1 | 1 | 52 | 1 | 615.16 | 60001.73 | 940.41 | 1437.27 | 172343.60 | 2293.64 | 87183.62 | 901.92 | 804.44 | 4000.00 |
| 9 | 1 | 2 | 52 | 1 | 549.64 | 43086.48 | 843.71 | 1287.65 | 109746.50 | 2375.89 | 58210.42 | 905.35 | 718.76 | 4000.00 |
| 10 | 1 | 3 | 52 | 1 | 301.60 | 52900.05 | 142.00 | 385.60 | 35000.00 | 1601.22 | 18000.00 | 874.35 | 394.40 | 2869.97 |
| 11 | 1 | 4 | 52 | 1 | 3641.30 | 150565.60 | 2000.00 | 4941.05 | 204577.30 | 2091.25 | 108084.66 | 1147.05 | 4761.70 | 8000.00 |
| 12 | 1 | 5 | 52 | 1 | 2883.66 | 196500.00 | 2136.62 | 4465.73 | 345000.00 | 2182.01 | 175000.00 | 1019.03 | 3770.94 | 6971.98 |
| 13 | 1 | 6 | 52 | 1 | 1591.98 | 187543.17 | 1742.50 | 3028.33 | 435000.00 | 1515.85 | 220000.00 | 407.13 | 2081.82 | 4004.81 |
| 14 | 1 | 7 | 52 | 1 | 39.52 | 181241.83 | 142.00 | 173.92 | 345000.00 | 1637.61 | 175000.00 | 760.72 | 51.68 | 2450.01 |
| 15 | 1 | 8 | 52 | 1 | 29.64 | 121388.77 | 1003.04 | 1026.98 | 285000.00 | 2002.77 | 145000.00 | 509.56 | 38.76 | 2551.09 |
| 16 | 1 | 9 | 52 | 1 | 58.76 | 82749.08 | 708.11 | 755.57 | 225000.00 | 1763.89 | 115000.00 | 547.10 | 76.84 | 2387.83 |
| 17 | 1 | 10 | 52 | 1 | 226.20 | 46137.67 | 821.62 | 1004.32 | 170000.00 | 1898.80 | 85000.00 | 653.20 | 295.80 | 2847.79 |
| 18 | 1 | 11 | 52 | 1 | 268.84 | 34143.99 | 470.40 | 687.54 | 135000.00 | 1275.72 | 70000.00 | 448.54 | 351.56 | 2075.82 |
| 19 | 1 | 12 | 52 | 1 | 777.92 | 14924.62 | 1090.49 | 1718.81 | 110000.00 | 2125.39 | 55000.00 | 812.43 | 1017.28 | 3955.10 |
| 20 | 1 | 1 | 53 | 1 | 651.04 | 6991.10 | 780.06 | 1305.90 | 75000.00 | 1875.12 | 38000.00 | 752.23 | 851.36 | 3478.71 |
| 21 | 1 | 2 | 53 | 1 | 634.92 | 0.00 | 760.80 | 1273.62 | 75000.00 | 1273.62 | 38000.00 | 463.98 | 830.28 | 2567.88 |
| 22 | 1 | 3 | 53 | 1 | 2771.60 | 47444.53 | 2000.00 | 4238.69 | 147817.87 | 3054.35 | 81299.25 | 1321.22 | 3624.40 | 7999.96 |
| 23 | 1 | 4 | 53 | 1 | 5210.40 | 196500.00 | 2705.48 | 6913.88 | 449362.66 | 1846.32 | 228133.24 | 1340.01 | 6813.60 | 9999.93 |
| 24 | 1 | 5 | 53 | 1 | 2363.92 | 196500.00 | 2363.92 | 4273.24 | 494013.35 | 3547.08 | 250629.89 | 1361.61 | 3091.28 | 7999.97 |
| 25 | 1 | 6 | 53 | 1 | 514.28 | 194250.23 | 552.09 | 967.47 | 416444.07 | 2271.04 | 210129.83 | 1056.44 | 672.52 | 4000.00 |
| 26 | 1 | 7 | 53 | 1 | 326.04 | 182578.16 | 515.87 | 779.21 | 345000.00 | 1941.11 | 175000.00 | 809.58 | 426.36 | 3177.06 |
| 27 | 1 | 8 | 53 | 1 | 166.66 | 121867.83 | 1154.00 | 1288.61 | 285000.00 | 2264.41 | 145000.00 | 609.69 | 217.94 | 3092.03 |
| 28 | 1 | 9 | 53 | 1 | 180.70 | 82864.72 | 836.16 | 982.11 | 225000.00 | 1990.43 | 115000.00 | 636.21 | 236.30 | 2862.94 |
| 29 | 1 | 10 | 53 | 1 | 502.06 | 46185.52 | 1098.58 | 1504.09 | 170000.00 | 2398.57 | 85000.00 | 854.79 | 656.54 | 3909.89 |
| 30 | 1 | 11 | 53 | 1 | 1336.14 | 35572.46 | 1514.50 | 2593.69 | 220310.81 | 1748.20 | 113078.44 | 504.54 | 1747.26 | 4000.00 |
| 31 | 1 | 12 | 53 | 1 | 1670.24 | 80000.00 | 947.71 | 2296.75 | 225000.00 | 2220.48 | 115000.00 | 1189.31 | 2184.16 | 5593.95 |
| 32 | 1 | 1 | 54 | 1 | 468.26 | 60001.36 | 793.50 | 1171.71 | 148603.37 | 2414.17 | 76182.05 | 973.49 | 612.34 | 4000.00 |
| 33 | 1 | 2 | 54 | 1 | 546.52 | 37151.33 | 957.95 | 1399.37 | 92984.20 | 2400.83 | 49240.13 | 884.49 | 714.68 | 4000.00 |
| 34 | 1 | 3 | 54 | 1 | 879.32 | 63720.08 | 447.23 | 1157.45 | 50470.24 | 1848.86 | 27185.45 | 1001.26 | 1149.88 | 4000.00 |
| 35 | 1 | 4 | 54 | 1 | 4438.20 | 196500.00 | 2206.79 | 5791.49 | 285000.00 | 1850.15 | 145000.00 | 1263.39 | 5803.80 | 8917.34 |
| 36 | 1 | 5 | 54 | 1 | 3515.20 | 196500.00 | 3515.20 | 6354.40 | 510448.17 | 2687.89 | 258971.18 | 715.26 | 4596.80 | 7999.95 |
| 37 | 1 | 6 | 54 | 1 | 2219.36 | 196500.00 | 2219.36 | 4011.92 | 544000.00 | 3448.07 | 276000.00 | 1335.67 | 2902.24 | 7685.98 |
| 38 | 1 | 7 | 54 | 1 | 997.88 | 196498.04 | 997.91 | 1803.89 | 456182.09 | 3232.09 | 230682.54 | 1462.97 | 1304.92 | 5999.99 |
| 39 | 1 | 8 | 54 | 1 | 1271.14 | 166255.40 | 1762.98 | 2789.67 | 430666.99 | 3204.63 | 218327.58 | 1133.09 | 1662.26 | 5999.98 |
| 40 | 1 | 9 | 54 | 1 | 2540.20 | 196500.00 | 2031.93 | 4083.63 | 544000.00 | 2179.03 | 276000.00 | 887.10 | 3321.80 | 6387.33 |
| 41 | 1 | 10 | 54 | 1 | 2495.48 | 196500.00 | 2495.48 | 4511.06 | 544000.00 | 4511.06 | 276000.00 | 1823.62 | 3263.32 | 9598.00 |
| 42 | 1 | 11 | 54 | 1 | 1806.22 | 196498.04 | 1806.25 | 3265.12 | 544000.00 | 3265.12 | 276000.00 | 1319.93 | 2361.98 | 6947.33 |
| 43 | 1 | 12 | 54 | 1 | 1233.70 | 196500.00 | 1233.67 | 2230.12 | 492714.74 | 3064.18 | 250116.22 | 1322.50 | 1613.30 | 5999.98 |
| 44 | 1 | 1 | 55 | 1 | 596.70 | 180426.88 | 858.10 | 1340.05 | 352874.70 | 3614.30 | 178214.96 | 1605.39 | 780.30 | 5999.99 |
| 45 | 1 | 2 | 55 | 1 | 630.76 | 133328.59 | 1478.80 | 1988.26 | 181656.91 | 5071.15 | 203814.65 | 0.00 | 824.84 | 5895.99 |
| 46 | 1 | 3 | 55 | 1 | 614.90 | 162406.50 | 142.00 | 638.65 | 135000.00 | 1397.44 | 75000.00 | 2544.29 | 804.10 | 4745.33 |
| 47 | 1 | 4 | 55 | 1 | 4256.20 | 196500.00 | 3683.25 | 7120.95 | 367984.04 | 3205.58 | 186572.62 | 1228.57 | 5565.80 | 9999.94 |
| 48 | 1 | 5 | 55 | 1 | 3309.80 | 196500.00 | 3309.80 | 5983.10 | 544000.00 | 3120.52 | 276000.00 | 970.83 | 4328.20 | 8419.55 |
| 49 | 1 | 6 | 55 | 1 | 1039.74 | 196498.04 | 1039.77 | 1879.56 | 465343.80 | 3201.40 | 235589.47 | 1438.92 | 1359.66 | 5999.99 |
| 50 | 1 | 7 | 55 | 1 | 1626.04 | 188993.32 | 1748.09 | 3061.43 | 480619.72 | 2813.00 | 243437.65 | 1060.62 | 2126.36 | 5999.98 |
| 51 | 1 | 8 | 55 | 1 | 444.60 | 172087.06 | 719.55 | 1078.65 | 375000.00 | 2796.36 | 190000.00 | 1193.97 | 581.40 | 4571.73 |
| 52 | 1 | 9 | 55 | 1 | 46.80 | 130804.63 | 740.56 | 778.36 | 246984.95 | 2929.70 | 131988.37 | 1009.10 | 61.20 | 4000.00 |

1

| LOC NO= | | | | | 1. | 1. | 1. | 2. | 2. | 2. | 3. | 3. | 4. | 4. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PER | DY | MO | YR | DW | BRASSUA INFLOW | BRASSUA EOP STOR | BRASSUA OUTFLOW | MOOSEHEAD INFLOW | MOOSEHEAD EOP STOR | MOOSEHEAD OUTFLOW | FLAGGSTAF EOP STOR | FLAGGSTAF OUTFLOW | BINGHAM G LOCAL IN | BINGHAM G FLOW REG |
| 53 | 1 | 10 | 55 | 1 | 50.96 | 72698.34 | 995.95 | 1037.11 | 170000.00 | 2289.14 | 85000.00 | 801.42 | 66.64 | 3157.20 |
| 54 | 1 | 11 | 55 | 1 | 679.64 | 48371.75 | 1088.46 | 1637.40 | 135000.00 | 2225.58 | 70000.00 | 748.74 | 888.76 | 3863.38 |
| 55 | 1 | 12 | 55 | 1 | 234.78 | 0.00 | 1021.46 | 1211.09 | 110000.00 | 1617.67 | 55000.00 | 415.52 | 307.02 | 2340.21 |
| 56 | 1 | 1 | 56 | 1 | 1023.10 | 6160.07 | 922.92 | 1749.27 | 101854.58 | 1881.74 | 52588.60 | 780.36 | 1337.90 | 4000.00 |
| 57 | 1 | 2 | 56 | 1 | 411.06 | 0.00 | 518.15 | 850.16 | 75000.00 | 1317.02 | 38000.00 | 560.96 | 537.54 | 2415.53 |
| 58 | 1 | 3 | 56 | 1 | 332.54 | 0.00 | 332.54 | 601.13 | 35000.00 | 1251.66 | 18000.00 | 568.27 | 434.86 | 2254.79 |
| 59 | 1 | 4 | 56 | 1 | 2227.68 | 15000.00 | 1975.60 | 3774.88 | 110000.00 | 2514.48 | 55000.00 | 1006.12 | 2913.12 | 6433.73 |
| 60 | 1 | 5 | 56 | 1 | 4464.20 | 166519.96 | 2000.00 | 5605.70 | 345000.00 | 1783.85 | 232333.17 | 378.29 | 5837.80 | 7999.34 |
| 61 | 1 | 6 | 56 | 1 | 1359.02 | 196500.00 | 855.20 | 1952.87 | 412391.54 | 820.33 | 207974.23 | 1402.49 | 1777.18 | 4000.00 |
| 62 | 1 | 7 | 56 | 1 | 490.62 | 182108.95 | 724.66 | 1120.93 | 345000.00 | 2216.94 | 175000.00 | 894.80 | 641.58 | 3753.31 |
| 63 | 1 | 8 | 56 | 1 | 262.60 | 121699.62 | 1245.05 | 1457.15 | 285000.00 | 2432.94 | 145000.00 | 679.80 | 343.40 | 3456.14 |
| 64 | 1 | 9 | 56 | 1 | 469.56 | 82824.12 | 1122.87 | 1502.13 | 225000.00 | 2510.45 | 115000.00 | 847.30 | 614.04 | 3971.79 |
| 65 | 1 | 10 | 56 | 1 | 525.20 | 46168.72 | 1121.33 | 1545.53 | 170000.00 | 2440.01 | 85000.00 | 871.70 | 686.80 | 3998.51 |
| 66 | 1 | 11 | 56 | 1 | 491.66 | 35564.35 | 669.87 | 1066.98 | 135000.00 | 1655.17 | 70000.00 | 611.37 | 642.94 | 2909.48 |
| 67 | 1 | 12 | 56 | 1 | 436.80 | 14678.67 | 776.47 | 1129.27 | 110000.00 | 1535.85 | 55000.00 | 563.15 | 571.20 | 2670.20 |
| 68 | 1 | 1 | 57 | 1 | 352.82 | 0.00 | 591.54 | 876.51 | 75000.00 | 1445.72 | 38000.00 | 534.30 | 461.38 | 2441.41 |
| 69 | 1 | 2 | 57 | 1 | 225.68 | 4647.42 | 142.00 | 324.28 | 30188.21 | 1131.15 | 15295.36 | 573.73 | 295.12 | 2000.00 |
| 70 | 1 | 3 | 57 | 1 | 479.96 | 7000.00 | 441.70 | 829.36 | 22229.46 | 958.79 | 11432.29 | 413.57 | 627.64 | 2000.00 |
| 71 | 1 | 4 | 57 | 1 | 2154.36 | 16185.19 | 2000.00 | 3740.06 | 110000.00 | 2265.05 | 55000.00 | 842.17 | 2817.24 | 5924.46 |
| 72 | 1 | 5 | 57 | 1 | 1676.74 | 60415.10 | 957.42 | 2311.71 | 200000.00 | 848.02 | 100000.00 | 493.47 | 2192.66 | 3534.15 |
| 73 | 1 | 6 | 57 | 1 | 621.14 | 88926.32 | 142.00 | 643.69 | 195282.15 | 722.98 | 99354.07 | 464.76 | 812.26 | 2000.00 |
| 74 | 1 | 7 | 57 | 1 | 408.46 | 100733.52 | 216.44 | 546.35 | 170145.02 | 955.16 | 86305.44 | 510.70 | 534.14 | 2000.00 |
| 75 | 1 | 8 | 57 | 1 | 423.80 | 61437.47 | 1062.88 | 1405.18 | 180939.05 | 1229.63 | 92056.71 | 216.17 | 554.20 | 2000.00 |
| 76 | 1 | 9 | 57 | 1 | 162.76 | 40717.63 | 510.96 | 642.42 | 140264.82 | 1325.97 | 71690.91 | 461.19 | 212.84 | 2000.00 |
| 77 | 1 | 10 | 57 | 1 | 149.76 | 0.00 | 811.96 | 932.92 | 110075.82 | 1423.89 | 55037.91 | 380.27 | 195.84 | 2000.00 |
| 78 | 1 | 11 | 57 | 1 | 1317.94 | 17919.67 | 1016.79 | 2081.28 | 138676.44 | 1600.64 | 72128.47 | 675.90 | 1723.46 | 4000.00 |
| 79 | 1 | 12 | 57 | 1 | 2460.64 | 80000.00 | 1451.01 | 3438.45 | 239436.56 | 1799.77 | 122286.16 | 982.44 | 3217.76 | 5999.37 |
| 80 | 1 | 1 | 58 | 1 | 1170.52 | 64526.26 | 1422.17 | 2367.59 | 200000.00 | 3008.96 | 100000.00 | 1217.82 | 1530.68 | 5757.46 |
| 81 | 1 | 2 | 58 | 1 | 514.28 | 51381.48 | 750.96 | 1166.34 | 131896.92 | 2392.58 | 68550.02 | 934.90 | 672.52 | 4000.00 |
| 82 | 1 | 3 | 58 | 1 | 556.14 | 76846.33 | 142.00 | 591.19 | 39989.49 | 2085.90 | 20962.51 | 1186.84 | 727.26 | 4000.00 |
| 83 | 1 | 4 | 58 | 1 | 5337.80 | 196500.00 | 3326.98 | 7638.28 | 376573.19 | 1981.89 | 191316.94 | 1037.84 | 6980.20 | 9999.33 |
| 84 | 1 | 5 | 58 | 1 | 4563.00 | 196500.00 | 4563.00 | 8248.50 | 544000.00 | 5525.60 | 276000.00 | 1957.28 | 5967.00 | 13449.89 |
| 85 | 1 | 6 | 58 | 1 | 656.50 | 196458.04 | 656.53 | 1186.78 | 435000.00 | 3018.56 | 220000.00 | 1420.85 | 858.50 | 5297.91 |
| 86 | 1 | 7 | 58 | 1 | 727.48 | 186097.44 | 896.63 | 1484.21 | 390014.76 | 2215.81 | 201476.66 | 832.87 | 951.32 | 4000.00 |
| 87 | 1 | 8 | 58 | 1 | 574.86 | 139266.83 | 1336.48 | 1800.79 | 349017.70 | 2467.53 | 179301.41 | 780.73 | 751.74 | 4000.00 |
| 88 | 1 | 9 | 58 | 1 | 332.80 | 110045.59 | 823.87 | 1092.67 | 258819.78 | 2698.48 | 136866.97 | 956.32 | 435.20 | 4000.00 |
| 89 | 1 | 10 | 58 | 1 | 867.88 | 80026.87 | 1356.08 | 2057.06 | 255000.00 | 2119.18 | 130000.00 | 745.90 | 1134.92 | 4000.00 |
| 90 | 1 | 11 | 58 | 1 | 1145.56 | 95000.00 | 893.93 | 1819.19 | 255000.00 | 1819.19 | 130000.00 | 837.14 | 1498.04 | 4154.37 |
| 91 | 1 | 12 | 58 | 1 | 527.54 | 80001.16 | 771.47 | 1197.56 | 183183.42 | 2365.53 | 95621.58 | 944.61 | 689.86 | 4000.00 |
| 92 | 1 | 1 | 59 | 1 | 537.94 | 47586.24 | 1065.11 | 1499.60 | 126531.85 | 2420.94 | 65953.78 | 875.60 | 703.46 | 4000.00 |
| 93 | 1 | 2 | 59 | 1 | 341.90 | 16898.32 | 894.46 | 1170.61 | 75000.00 | 2098.47 | 38000.00 | 753.18 | 447.10 | 3298.75 |
| 94 | 1 | 3 | 59 | 1 | 345.28 | 0.00 | 620.10 | 898.98 | 35000.00 | 1549.51 | 18000.00 | 577.58 | 451.52 | 2578.61 |
| 95 | 1 | 4 | 59 | 1 | 3668.60 | 99290.04 | 2000.00 | 4963.10 | 207746.25 | 2060.05 | 109539.26 | 1142.55 | 4797.40 | 8000.00 |
| 96 | 1 | 5 | 59 | 1 | 1940.12 | 109448.58 | 1774.91 | 3341.93 | 345000.00 | 1109.74 | 175000.00 | 353.18 | 2537.08 | 4000.00 |
| 97 | 1 | 6 | 59 | 1 | 2610.40 | 196500.00 | 1147.47 | 3255.87 | 447122.66 | 1539.67 | 226228.15 | 1046.69 | 3413.60 | 5999.97 |
| 98 | 1 | 7 | 59 | 1 | 627.38 | 187254.56 | 777.74 | 1284.47 | 385426.59 | 2287.85 | 199587.42 | 891.73 | 820.42 | 4000.00 |
| 99 | 1 | 8 | 59 | 1 | 362.18 | 138036.83 | 1162.62 | 1455.15 | 310492.94 | 2673.81 | 163438.27 | 852.57 | 473.62 | 4000.00 |
| 100 | 1 | 9 | 59 | 1 | 76.70 | 95793.88 | 786.61 | 848.56 | 225000.00 | 2285.29 | 115000.00 | 870.07 | 100.30 | 3255.66 |
| 101 | 1 | 10 | 59 | 1 | 881.92 | 51535.52 | 1601.70 | 2314.02 | 227993.63 | 2265.34 | 118879.73 | 581.38 | 1153.28 | 4000.00 |
| 102 | 1 | 11 | 59 | 1 | 2033.46 | 95000.00 | 1303.03 | 2945.44 | 272784.50 | 2192.71 | 138584.56 | 1148.12 | 2659.14 | 5999.97 |
| 103 | 1 | 12 | 59 | 1 | 1453.66 | 85306.91 | 1611.30 | 2785.41 | 262425.69 | 2953.88 | 133888.83 | 1145.16 | 1900.94 | 5999.98 |
| 104 | 1 | 1 | 60 | 1 | 623.74 | 73395.17 | 817.46 | 1321.25 | 200000.00 | 2336.49 | 100000.00 | 1006.95 | 815.66 | 4159.11 |

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| PER | DY | MO | YR | DW | BRASSUA INFLOW | BRASSUA EOP STOR | BRASSUA OUTFLOW | MOOSEHEAD INFLOW | MOOSEHEAD EOP STOR | MOOSEHEAD OUTFLOW | FLAGGSTAF EOP STOR | FLAGGSTAF OUTFLOW | BINGHAM 6 LOCAL IN | BINGHAM 6 FLOW REG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOC NO | | | | | 1. | 1. | 1. | 2. | 2. | 2. | 3. | 3. | 4. | . |
| 105 | 1 | 2 | 60 | 1 | 713.18 | 54085.53 | 1048.87 | 1624.90 | 162983.04 | 2268.44 | 84022.08 | 798.94 | 932.62 | 4000.00 |
| 106 | 1 | 3 | 60 | 1 | 387.40 | 41916.47 | 585.31 | 898.21 | 67537.60 | 2450.46 | 37300.43 | 1042.94 | 506.60 | 4000.00 |
| 107 | 1 | 4 | 60 | 1 | 4498.00 | 190559.96 | 2000.00 | 5633.00 | 285000.00 | 1978.48 | 145000.00 | 1477.08 | 5882.00 | 9337.55 |
| 108 | 1 | 5 | 60 | 1 | 3614.00 | 196500.00 | 3517.40 | 6436.40 | 522007.20 | 2581.90 | 264837.82 | 692.05 | 4726.00 | 7999.95 |
| 109 | 1 | 6 | 60 | 1 | 1023.88 | 195510.22 | 1040.51 | 1867.49 | 441696.09 | 2217.15 | 223440.19 | 1443.92 | 1338.92 | 5999.99 |
| 110 | 1 | 7 | 60 | 1 | 438.36 | 186542.21 | 582.58 | 936.64 | 351611.23 | 2401.71 | 180108.68 | 1025.05 | 573.24 | 4000.00 |
| 111 | 1 | 8 | 60 | 1 | 210.08 | 125654.82 | 1201.28 | 1370.96 | 285000.00 | 2454.27 | 145000.00 | 724.50 | 274.72 | 3453.49 |
| 112 | 1 | 9 | 60 | 1 | 438.62 | 83788.47 | 1142.87 | 1497.14 | 225000.00 | 2505.46 | 115000.00 | 824.69 | 573.58 | 3903.73 |
| 113 | 1 | 10 | 60 | 1 | 503.62 | 46567.76 | 1108.95 | 1515.72 | 170000.00 | 2410.19 | 85000.00 | 855.93 | 658.58 | 3924.70 |
| 114 | 1 | 11 | 60 | 1 | 914.68 | 35756.99 | 1096.36 | 1835.14 | 155348.60 | 2081.36 | 81780.77 | 722.52 | 1196.12 | 4000.00 |
| 115 | 1 | 12 | 60 | 1 | 620.62 | 22711.85 | 832.78 | 1334.05 | 110000.00 | 2071.56 | 55000.00 | 889.07 | 811.58 | 3772.21 |
| 116 | 1 | 1 | 61 | 1 | 377.52 | 0.00 | 746.89 | 1051.81 | 75000.00 | 1621.02 | 38000.00 | 552.35 | 493.68 | 2667.05 |
| 117 | 1 | 2 | 61 | 1 | 335.40 | 0.00 | 335.40 | 606.30 | 48828.33 | 1077.54 | 24739.69 | 483.86 | 438.60 | 2000.00 |
| 118 | 1 | 3 | 61 | 1 | 607.10 | 0.00 | 607.10 | 1097.45 | 35000.00 | 1322.34 | 18000.00 | 553.26 | 793.90 | 2669.50 |
| 119 | 1 | 4 | 61 | 1 | 2388.88 | 23140.30 | 2000.00 | 3929.48 | 110000.00 | 2669.08 | 55000.00 | 1123.92 | 3123.92 | 6916.93 |
| 120 | 1 | 5 | 61 | 1 | 6094.40 | 196500.00 | 3275.02 | 8197.42 | 544000.00 | 1139.19 | 276000.00 | 859.43 | 7969.60 | 9968.22 |
| 121 | 1 | 6 | 61 | 1 | 1601.60 | 196498.04 | 1601.63 | 2895.23 | 544000.00 | 2895.23 | 276000.00 | 1170.40 | 2094.40 | 6160.03 |
| 122 | 1 | 7 | 61 | 1 | 646.10 | 196500.00 | 646.07 | 1167.92 | 435000.00 | 2940.61 | 220000.00 | 1382.89 | 844.90 | 5168.40 |
| 123 | 1 | 8 | 61 | 1 | 269.62 | 158961.00 | 880.12 | 1097.89 | 336288.58 | 2703.26 | 174060.00 | 944.16 | 352.58 | 4000.00 |
| 124 | 1 | 9 | 61 | 1 | 457.86 | 112542.49 | 1237.94 | 1607.75 | 278545.90 | 2578.13 | 144989.49 | 823.13 | 598.74 | 4000.00 |
| 125 | 1 | 10 | 61 | 1 | 316.16 | 77465.84 | 886.62 | 1141.98 | 186214.03 | 2643.59 | 101214.03 | 942.97 | 413.44 | 4000.00 |
| 126 | 1 | 11 | 61 | 1 | 605.28 | 57540.55 | 940.13 | 1429.01 | 136811.96 | 2259.23 | 71049.03 | 949.25 | 791.52 | 4000.00 |
| 127 | 1 | 12 | 61 | 1 | 752.18 | 23898.22 | 1299.31 | 1906.84 | 115061.33 | 2260.58 | 58374.22 | 755.80 | 983.62 | 4000.00 |
| 128 | 1 | 1 | 62 | 1 | 569.66 | 8524.56 | 819.68 | 1279.79 | 75000.00 | 1931.32 | 38000.00 | 747.64 | 744.94 | 3423.90 |
| 129 | 1 | 2 | 62 | 1 | 339.82 | 0.00 | 493.31 | 767.78 | 55112.87 | 1125.86 | 27523.86 | 429.76 | 444.38 | 2000.00 |
| 130 | 1 | 3 | 62 | 1 | 440.70 | 7000.00 | 326.86 | 682.81 | 35000.00 | 1009.91 | 18000.00 | 483.44 | 576.30 | 2069.55 |
| 131 | 1 | 4 | 62 | 1 | 3900.00 | 120659.50 | 2000.00 | 5150.00 | 234606.80 | 1795.55 | 121868.70 | 1104.45 | 5100.00 | 8000.00 |
| 132 | 1 | 5 | 62 | 1 | 3016.00 | 182531.82 | 2000.00 | 4436.00 | 345000.00 | 2640.65 | 175000.00 | 1339.91 | 3944.00 | 7924.57 |
| 133 | 1 | 6 | 62 | 1 | 558.48 | 196500.00 | 323.74 | 774.82 | 285000.00 | 1783.14 | 145000.00 | 912.28 | 730.32 | 3425.74 |
| 134 | 1 | 7 | 62 | 1 | 301.60 | 148952.24 | 1074.88 | 1318.48 | 282566.55 | 1358.05 | 143330.86 | 247.55 | 394.40 | 2000.00 |
| 135 | 1 | 8 | 62 | 1 | 816.14 | 97871.34 | 1646.88 | 2306.07 | 285000.00 | 2266.49 | 145000.00 | 569.26 | 1067.26 | 3903.02 |
| 136 | 1 | 9 | 62 | 1 | 312.26 | 77544.36 | 653.86 | 906.07 | 225000.00 | 1914.39 | 115000.00 | 732.35 | 408.34 | 3055.08 |
| 137 | 1 | 10 | 62 | 1 | 814.84 | 44638.14 | 1350.00 | 2008.14 | 208715.50 | 2272.98 | 110541.68 | 661.46 | 1065.56 | 4000.00 |
| 138 | 1 | 11 | 62 | 1 | 2299.18 | 95000.00 | 1452.83 | 3309.86 | 290523.63 | 1935.05 | 147546.19 | 1058.30 | 3006.62 | 5999.97 |
| 139 | 1 | 12 | 62 | 1 | 1127.36 | 90599.12 | 1198.93 | 2109.49 | 225368.67 | 3169.12 | 115186.07 | 1356.62 | 1474.24 | 5999.99 |
| 140 | 1 | 1 | 63 | 1 | 409.50 | 63439.03 | 851.21 | 1181.96 | 144380.24 | 2499.09 | 74224.99 | 965.41 | 535.50 | 4000.00 |
| 141 | 1 | 2 | 63 | 1 | 474.24 | 36954.97 | 951.10 | 1334.14 | 81916.06 | 2458.85 | 42322.54 | 920.99 | 620.16 | 4000.00 |
| 142 | 1 | 3 | 63 | 1 | 377.78 | 0.00 | 978.79 | 1283.92 | 35000.00 | 2046.92 | 18000.00 | 671.63 | 494.02 | 3212.57 |
| 143 | 1 | 4 | 63 | 1 | 3356.60 | 80724.48 | 2000.00 | 4711.10 | 171529.77 | 2416.67 | 92915.30 | 1193.93 | 4389.40 | 8000.00 |
| 144 | 1 | 5 | 63 | 1 | 4113.20 | 196500.00 | 2230.32 | 5552.52 | 417643.58 | 1549.92 | 211869.35 | 1071.23 | 5378.80 | 7999.95 |
| 145 | 1 | 6 | 63 | 1 | 440.96 | 190812.84 | 536.53 | 892.69 | 332081.87 | 2330.59 | 166018.69 | 1092.77 | 576.64 | 4000.00 |
| 146 | 1 | 7 | 63 | 1 | 548.60 | 159726.21 | 1054.17 | 1497.27 | 345000.00 | 1287.18 | 175000.00 | 254.84 | 717.40 | 2259.41 |
| 147 | 1 | 8 | 63 | 1 | 546.00 | 114761.57 | 1277.27 | 1718.27 | 295230.84 | 2527.68 | 152505.65 | 758.32 | 714.00 | 4000.00 |
| 148 | 1 | 9 | 63 | 1 | 521.30 | 83618.93 | 1044.66 | 1465.71 | 236601.70 | 2450.99 | 123564.95 | 867.31 | 681.70 | 4000.00 |
| 149 | 1 | 10 | 63 | 1 | 456.04 | 51298.31 | 981.68 | 1350.02 | 170000.00 | 2433.17 | 85000.00 | 966.95 | 596.36 | 3996.49 |
| 150 | 1 | 11 | 63 | 1 | 4108.00 | 176734.85 | 2000.00 | 5318.00 | 471571.34 | 250.00 | 241144.32 | 377.95 | 5372.00 | 5999.95 |
| 151 | 1 | 12 | 63 | 1 | 1496.30 | 168996.48 | 1622.15 | 2830.70 | 467832.47 | 2891.51 | 237558.08 | 1151.77 | 1956.70 | 5999.98 |
| 152 | 1 | 1 | 64 | 1 | 520.78 | 164007.45 | 601.92 | 1022.55 | 308896.15 | 3607.36 | 155714.31 | 1711.61 | 681.02 | 5999.99 |
| 153 | 1 | 2 | 64 | 1 | 273.00 | 114913.80 | 1126.48 | 1346.98 | 165000.00 | 3848.59 | 85000.00 | 1428.85 | 357.00 | 5634.44 |
| 154 | 1 | 3 | 64 | 1 | 505.18 | 137245.20 | 142.00 | 550.03 | 65234.83 | 2172.53 | 35551.93 | 1166.85 | 660.62 | 4000.00 |
| 155 | 1 | 4 | 64 | 1 | 2730.00 | 180683.85 | 2000.00 | 4205.00 | 135288.07 | 3027.73 | 71222.54 | 1402.27 | 3570.00 | 8000.00 |
| 156 | 1 | 5 | 64 | 1 | 1495.52 | 149664.13 | 2000.00 | 3207.92 | 230370.62 | 1661.57 | 114887.56 | 382.75 | 1955.68 | 4000.00 |

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| LOC NO= | | | | | 1. | 1. | 1. | 2. | [illegible]. | 2. | 3. | 3. | 4. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PER | DY | MO | YR | DW | BRASSUA INFLOW | BRASSUA EOP STOR | BRASSUA OUTFLOW | MOOSEHEAD INFLOW | [illegible]EHEAD EOP STOR | MOOSEHEAD OUTFLOW | FLAGGSTAF EOP STOR | FLAGGSTAF OUTFLOW | BINGHAM 6 LOCAL IN | BI[illegible] 4 5 FLOW RES |
| 157 | 1 | 6 | 64 | 1 | 425.10 | 147615.38 | 459.53 | 802.88 | 215796.44 | 1047.80 | 109791.17 | 396.30 | 555.90 | 2000.00 |
| 158 | 1 | 7 | 64 | 1 | 687.96 | 128805.59 | 993.87 | 1549.53 | 254848.16 | 914.42 | 129270.81 | 185.94 | 899.64 | 2000.00 |
| 159 | 1 | 8 | 64 | 1 | 239.98 | 87015.35 | 919.62 | 1113.45 | 238396.59 | 1381.01 | 121289.50 | 305.17 | 313.82 | 2000.00 |
| 160 | 1 | 9 | 64 | 1 | 143.52 | 65907.02 | 498.25 | 614.17 | 194976.52 | 1343.86 | 99654.67 | 468.46 | 187.68 | 2000.00 |
| 161 | 1 | 10 | 64 | 1 | 263.12 | 38451.46 | 708.98 | 921.50 | 170000.00 | 1327.70 | 85000.00 | 430.61 | 344.08 | 2102.39 |
| 162 | 1 | 11 | 64 | 1 | 566.54 | 33940.82 | 643.01 | 1100.60 | 135000.00 | 1688.79 | 70000.00 | 666.09 | 740.86 | 3095.74 |
| 163 | 1 | 12 | 64 | 1 | 761.28 | 14906.69 | 1070.84 | 1685.72 | 110000.00 | 2092.30 | 55000.00 | 800.27 | 995.52 | 3888.38 |
| 164 | 1 | 1 | 65 | 1 | 514.80 | 0.00 | 757.23 | 1173.03 | 75000.00 | 1742.24 | 38000.00 | 652.67 | 673.20 | 3068.12 |
| 165 | 1 | 2 | 65 | 1 | 392.08 | 0.00 | 392.08 | 708.76 | 56864.14 | 1035.31 | 28811.16 | 451.97 | 512.72 | 2000.00 |
| 166 | 1 | 3 | 65 | 1 | 418.86 | 7000.00 | 305.02 | 643.33 | 35000.00 | 998.91 | 18000.00 | 481.91 | 547.74 | 2028.56 |
| 167 | 1 | 4 | 65 | 1 | 1594.06 | 15000.00 | 1459.62 | 2747.13 | 110000.00 | 1486.73 | 55000.00 | 543.09 | 2084.54 | 4114.36 |
| 168 | 1 | 5 | 65 | 1 | 1903.72 | 60000.28 | 1171.87 | 2709.49 | 216282.77 | 980.99 | 107581.75 | 529.53 | 2489.48 | 4000.00 |
| 169 | 1 | 6 | 65 | 1 | 646.36 | 90012.22 | 142.00 | 664.06 | 214195.40 | 699.14 | 108576.61 | 455.62 | 845.24 | 2000.00 |
| 170 | 1 | 7 | 65 | 1 | 223.08 | 94997.71 | 142.00 | 322.18 | 164516.34 | 1130.12 | 83450.32 | 578.16 | 291.72 | 2000.00 |
| 171 | 1 | 8 | 65 | 1 | 343.46 | 58859.96 | 931.18 | 1208.59 | 160629.79 | 1271.79 | 81723.93 | 279.07 | 449.14 | 2000.00 |
| 172 | 1 | 9 | 65 | 1 | 364.26 | 44454.42 | 606.35 | 900.56 | 146326.60 | 1140.93 | 74789.15 | 382.73 | 476.34 | 2000.00 |
| 173 | 1 | 10 | 65 | 1 | 1014.00 | 28148.47 | 1279.19 | 2098.19 | 170000.00 | 1713.18 | 85000.00 | 574.94 | 1326.00 | 3614.12 |
| 174 | 1 | 11 | 65 | 1 | 1062.10 | 32257.08 | 993.05 | 1850.90 | 167267.90 | 1896.82 | 88681.42 | 714.28 | 1388.90 | 4000.00 |
| 175 | 1 | 12 | 65 | 1 | 508.30 | 25788.16 | 613.51 | 1024.06 | 110000.00 | 1955.41 | 55000.00 | 919.22 | 664.70 | 3539.33 |
| 176 | 1 | 1 | 66 | 1 | 453.18 | 0.00 | 872.58 | 1238.61 | 75000.00 | 1807.82 | 38000.00 | 607.64 | 592.62 | 3008.38 |
| 177 | 1 | 2 | 66 | 1 | 187.72 | 2539.20 | 142.00 | 293.62 | 26205.69 | 1172.20 | 13277.55 | 582.32 | 245.48 | 2000.00 |
| 178 | 1 | 3 | 66 | 1 | 1382.16 | 2453.90 | 1383.55 | 2499.91 | 77576.82 | 1664.45 | 42510.58 | 528.11 | 1807.44 | 4000.00 |
| 179 | 1 | 4 | 66 | 1 | 2782.00 | 48986.81 | 2000.00 | 4247.00 | 152410.96 | 2989.39 | 82207.03 | 1372.61 | 3638.00 | 8000.00 |
| 180 | 1 | 5 | 66 | 1 | 2943.20 | 140000.00 | 1463.03 | 3840.23 | 345000.00 | 708.12 | 175000.00 | 641.69 | 3848.80 | 5198.51 |
| 181 | 1 | 6 | 66 | 1 | 947.44 | 187927.71 | 142.00 | 907.24 | 299441.44 | 1672.87 | 151447.07 | 1088.17 | 1238.96 | 4000.00 |
| 182 | 1 | 7 | 66 | 1 | 374.92 | 150479.83 | 983.94 | 1286.76 | 301228.66 | 1257.70 | 152797.15 | 252.02 | 490.28 | 2000.00 |
| 183 | 1 | 8 | 66 | 1 | 172.64 | 102450.45 | 953.75 | 1093.19 | 278310.16 | 1465.92 | 141596.40 | 308.32 | 225.76 | 2000.00 |
| 184 | 1 | 9 | 66 | 1 | 130.78 | 77116.87 | 556.52 | 662.15 | 225000.00 | 1558.04 | 115000.00 | 542.53 | 171.02 | 2271.59 |
| 185 | 1 | 10 | 66 | 1 | 537.94 | 44575.07 | 1067.17 | 1501.66 | 170000.00 | 2396.14 | 85000.00 | 881.01 | 703.46 | 3980.61 |
| 186 | 1 | 11 | 66 | 1 | 1612.78 | 45664.46 | 1594.47 | 2897.10 | 255000.00 | 1468.65 | 130000.00 | 422.33 | 2109.02 | 4000.00 |
| 187 | 1 | 12 | 66 | 1 | 836.94 | 62270.27 | 566.88 | 1242.87 | 211587.31 | 1948.90 | 108784.36 | 956.64 | 1094.46 | 4000.00 |
| 188 | 1 | 1 | 67 | 1 | 465.14 | 50754.78 | 652.42 | 1028.11 | 128889.66 | 2373.04 | 67046.43 | 1018.70 | 608.26 | 4000.00 |
| 189 | 1 | 2 | 67 | 1 | 272.48 | 10413.47 | 998.85 | 1218.93 | 75000.00 | 2189.25 | 38000.00 | 722.12 | 356.32 | 3267.59 |
| 190 | 1 | 3 | 67 | 1 | 233.74 | 7000.00 | 289.25 | 478.04 | 32170.04 | 1174.60 | 16544.59 | 519.74 | 305.66 | 2000.00 |
| 191 | 1 | 4 | 67 | 1 | 1896.18 | 15000.00 | 1761.74 | 3293.27 | 110000.00 | 1985.31 | 55000.00 | 739.41 | 2479.62 | 5204.35 |
| 192 | 1 | 5 | 67 | 1 | 3601.00 | 140000.00 | 1568.10 | 4476.60 | 345000.00 | 654.75 | 175000.00 | 679.92 | 4709.00 | 6043.66 |
| 193 | 1 | 6 | 67 | 1 | 1899.04 | 196500.00 | 949.54 | 2483.38 | 435000.00 | 970.90 | 220000.00 | 631.52 | 2483.36 | 4085.78 |
| 194 | 1 | 7 | 67 | 1 | 887.12 | 186097.63 | 1056.30 | 1772.82 | 416758.39 | 2069.48 | 212488.75 | 770.44 | 1160.08 | 4000.00 |
| 195 | 1 | 8 | 67 | 1 | 591.24 | 148854.23 | 1196.94 | 1674.48 | 371714.31 | 2407.04 | 188647.07 | 819.80 | 773.16 | 4000.00 |
| 196 | 1 | 9 | 67 | 1 | 715.52 | 125000.00 | 1116.40 | 1694.32 | 315000.00 | 2647.42 | 160000.00 | 1004.30 | 935.68 | 4587.40 |
| 197 | 1 | 10 | 67 | 1 | 956.02 | 95001.01 | 1443.90 | 2216.07 | 255000.00 | 3191.86 | 130000.00 | 1186.53 | 1250.18 | 5628.57 |
| 198 | 1 | 11 | 67 | 1 | 730.60 | 95001.28 | 730.60 | 1320.70 | 207182.04 | 2124.29 | 107006.75 | 920.31 | 955.40 | 4000.00 |
| 199 | 1 | 12 | 67 | 1 | 767.00 | 62816.11 | 1290.43 | 1909.93 | 185237.54 | 2266.82 | 96573.49 | 730.18 | 1003.00 | 4000.00 |
| 200 | 1 | 1 | 68 | 1 | 522.08 | 43094.24 | 842.82 | 1264.50 | 117388.89 | 2367.94 | 61658.92 | 949.34 | 682.72 | 4000.00 |
| 201 | 1 | 2 | 68 | 1 | 478.66 | 22155.97 | 842.67 | 1229.28 | 75000.00 | 1966.20 | 38000.00 | 761.10 | 625.94 | 3353.24 |
| 202 | 1 | 3 | 68 | 1 | 993.98 | 10277.05 | 1187.17 | 1990.00 | 73412.18 | 2015.82 | 40583.28 | 684.36 | 1299.82 | 4000.00 |
| 203 | 1 | 4 | 68 | 1 | 4235.40 | 143294.52 | 2000.00 | 5420.90 | 285000.00 | 1865.10 | 145000.00 | 1340.34 | 5538.60 | 8744.35 |
| 204 | 1 | 5 | 68 | 1 | 1361.36 | 145445.26 | 1326.38 | 2425.94 | 334457.02 | 1621.61 | 169392.03 | 598.15 | 1780.24 | 4000.00 |
| 205 | 1 | 6 | 68 | 1 | 1149.46 | 179167.97 | 582.74 | 1511.15 | 330061.29 | 1585.02 | 165116.65 | 911.84 | 1503.14 | 4000.00 |
| 206 | 1 | 7 | 68 | 1 | 509.86 | 156169.45 | 883.89 | 1295.70 | 342199.14 | 1098.30 | 173579.27 | 234.96 | 666.74 | 2000.00 |
| 207 | 1 | 8 | 68 | 1 | 16.38 | 113226.97 | 714.76 | 727.99 | 285000.00 | 1658.23 | 145000.00 | 476.76 | 21.42 | 2156.41 |
| 208 | 1 | 9 | 68 | 1 | 125.58 | 80778.99 | 670.88 | 772.31 | 225000.00 | 1780.63 | 115000.00 | 595.93 | 164.22 | 2540.78 |

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| LOC NO= | | | | | 1. | 1. | 1. | 2. | 2. | 2. | 3. | 3. | 4. | . |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PER | DY | MO | YR | DW | BRASSUA INFLOW | BRASSUA EOP STOR | BRASSUA OUTFLOW | MOOSEHEAD INFLOW | MOOSEHEAD EOP STOR | MOOSEHEAD OUTFLOW | FLAGGSTAF EOP STOR | FLAGGSTAF OUTFLOW | BINGHAM & LOCAL IN | BINGHAM & FLOW REG |
| 209 | 1 | 10 | 68 | 1 | 89.44 | 45322.46 | 666.08 | 738.32 | 170000.00 | 1632.79 | 85000.00 | 553.26 | 116.96 | 2303.01 |
| 210 | 1 | 11 | 68 | 1 | 368.94 | 35155.81 | 539.79 | 837.78 | 135000.00 | 1425.97 | 70000.00 | 521.69 | 482.46 | 2430.12 |
| 211 | 1 | 12 | 68 | 1 | 509.08 | 15057.12 | 835.95 | 1247.13 | 110000.00 | 1653.71 | 55000.00 | 615.97 | 665.72 | 2935.40 |
| 212 | 1 | 1 | 69 | 1 | 407.16 | 0.00 | 652.04 | 980.90 | 75000.00 | 1550.11 | 38000.00 | 574.01 | 532.44 | 2656.56 |
| 213 | 1 | 2 | 69 | 1 | 393.12 | 0.00 | 393.12 | 710.64 | 57011.59 | 1034.53 | 28885.87 | 451.39 | 514.08 | 2000.00 |
| 214 | 1 | 3 | 69 | 1 | 329.94 | 7000.00 | 216.10 | 482.59 | 22419.39 | 1045.17 | 11529.97 | 523.37 | 431.46 | 2000.00 |
| 215 | 1 | 4 | 69 | 1 | 3411.20 | 90973.46 | 2000.00 | 4755.20 | 164810.47 | 2362.27 | 89831.04 | 1176.93 | 4460.80 | 8000.00 |
| 216 | 1 | 5 | 69 | 1 | 7763.60 | 196500.00 | 6047.40 | 12318.00 | 544000.00 | 6151.16 | 276000.00 | 2645.70 | 10152.40 | 18949.26 |
| 217 | 1 | 6 | 69 | 1 | 1702.48 | 196458.04 | 1702.51 | 3077.59 | 544000.00 | 3077.59 | 276000.00 | 1244.12 | 2226.32 | 6548.33 |
| 218 | 1 | 7 | 69 | 1 | 730.08 | 196500.00 | 730.05 | 1319.73 | 435000.00 | 3092.42 | 220000.00 | 1444.26 | 954.72 | 5491.40 |
| 219 | 1 | 8 | 69 | 1 | 780.52 | 158961.00 | 1391.02 | 2021.44 | 375000.00 | 2997.24 | 190000.00 | 1058.28 | 1020.68 | 5076.19 |
| 220 | 1 | 9 | 69 | 1 | 1225.38 | 126346.14 | 1773.48 | 2763.21 | 345555.16 | 3258.04 | 175477.72 | 1139.52 | 1602.42 | 5999.98 |
| 221 | 1 | 10 | 69 | 1 | 261.30 | 105776.33 | 595.83 | 806.88 | 235481.61 | 2597.03 | 121963.02 | 1061.27 | 341.70 | 4000.00 |
| 222 | 1 | 11 | 69 | 1 | 3289.00 | 182478.27 | 2000.00 | 4656.50 | 448632.32 | 1074.44 | 227821.17 | 624.52 | 4301.00 | 5999.96 |
| 223 | 1 | 12 | 69 | 1 | 2385.76 | 196500.00 | 2157.72 | 4084.68 | 544000.00 | 2533.70 | 276000.00 | 959.90 | 3119.84 | 6613.44 |
| 224 | 1 | 1 | 70 | 1 | 1037.14 | 196498.04 | 1037.17 | 1874.86 | 462200.39 | 3205.19 | 234149.04 | 1438.54 | 1356.26 | 5999.99 |
| 225 | 1 | 2 | 70 | 1 | 1526.46 | 171560.92 | 1975.47 | 3208.38 | 442173.34 | 3568.98 | 276000.00 | 361.93 | 1996.14 | 5927.06 |
| 226 | 1 | 3 | 70 | 1 | 583.44 | 196500.00 | 177.85 | 649.09 | 221699.23 | 4234.71 | 117607.69 | 3002.33 | 762.96 | 7999.99 |
| 227 | 1 | 4 | 70 | 1 | 3749.20 | 196500.00 | 3749.20 | 6777.40 | 399439.44 | 3790.42 | 202682.50 | 1306.73 | 4902.80 | 9999.95 |
| 228 | 1 | 5 | 70 | 1 | 4230.20 | 196500.00 | 4230.20 | 7646.90 | 544000.00 | 5295.88 | 276000.00 | 1902.18 | 5531.80 | 12729.96 |
| 229 | 1 | 6 | 70 | 1 | 743.34 | 196498.04 | 743.37 | 1343.76 | 435000.00 | 3175.54 | 220000.00 | 1484.31 | 972.06 | 5631.91 |
| 230 | 1 | 7 | 70 | 1 | 321.10 | 186097.44 | 490.25 | 749.60 | 345000.00 | 2213.29 | 175000.00 | 966.49 | 419.90 | 3599.68 |
| 231 | 1 | 8 | 70 | 1 | 44.72 | 123129.46 | 1068.78 | 1104.90 | 285000.00 | 2080.69 | 145000.00 | 520.58 | 58.48 | 2659.75 |
| 232 | 1 | 9 | 70 | 1 | 187.72 | 83169.25 | 859.26 | 1010.88 | 225000.00 | 2019.20 | 115000.00 | 641.34 | 245.48 | 2906.02 |
| 233 | 1 | 10 | 70 | 1 | 1262.82 | 90864.79 | 1137.67 | 2157.64 | 255000.00 | 1669.74 | 130000.00 | 678.88 | 1651.38 | 4000.00 |
| 234 | 1 | 11 | 70 | 1 | 754.52 | 93205.71 | 715.18 | 1324.60 | 209359.77 | 2091.60 | 107962.83 | 521.72 | 986.68 | 4000.00 |
| 235 | 1 | 12 | 70 | 1 | 626.08 | 62953.45 | 1118.08 | 1623.76 | 163284.86 | 2373.08 | 86400.30 | 808.20 | 818.72 | 4000.00 |
| 236 | 1 | 1 | 71 | 1 | 324.22 | 36617.81 | 752.52 | 1014.39 | 75000.00 | 2450.19 | 38000.00 | 1024.07 | 423.98 | 3898.24 |
| 237 | 1 | 2 | 71 | 1 | 511.94 | 0.00 | 1171.27 | 1584.76 | 75000.00 | 1584.76 | 38000.00 | 374.11 | 669.46 | 2628.33 |
| 238 | 1 | 3 | 71 | 1 | 463.32 | 0.00 | 463.32 | 837.54 | 35000.00 | 1488.07 | 18000.00 | 663.84 | 605.88 | 2757.79 |
| 239 | 1 | 4 | 71 | 1 | 2888.60 | 52876.14 | 2000.00 | 4333.10 | 122296.25 | 2866.06 | 62888.16 | 1356.54 | 3777.40 | 8000.00 |
| 240 | 1 | 5 | 71 | 1 | 5249.40 | 196500.00 | 2913.62 | 7153.52 | 524836.03 | 606.93 | 266273.56 | 528.40 | 6864.60 | 7999.93 |
| 241 | 1 | 6 | 71 | 1 | 530.40 | 195637.55 | 544.89 | 973.29 | 435000.00 | 2483.02 | 220000.00 | 1165.24 | 693.60 | 4341.86 |
| 242 | 1 | 7 | 71 | 1 | 186.16 | 186015.32 | 342.65 | 493.01 | 345000.00 | 1956.70 | 175000.00 | 867.88 | 243.44 | 3068.02 |
| 243 | 1 | 8 | 71 | 1 | 325.00 | 123100.02 | 1348.20 | 1610.70 | 285000.00 | 2586.50 | 145000.00 | 725.40 | 425.00 | 3736.89 |
| 244 | 1 | 9 | 71 | 1 | 134.68 | 83162.14 | 805.85 | 914.63 | 225000.00 | 1922.95 | 115000.00 | 602.58 | 176.12 | 2701.65 |
| 245 | 1 | 10 | 71 | 1 | 216.32 | 46308.59 | 815.68 | 990.40 | 170000.00 | 1884.87 | 85000.00 | 645.98 | 282.88 | 2813.73 |
| 246 | 1 | 11 | 71 | 1 | 229.84 | 27085.06 | 552.90 | 738.54 | 135000.00 | 1326.72 | 70000.00 | 420.04 | 300.56 | 2047.32 |
| 247 | 1 | 12 | 71 | 1 | 316.68 | 0.00 | 757.17 | 1012.95 | 110000.00 | 1419.53 | 55000.00 | 475.37 | 414.12 | 2309.02 |
| 248 | 1 | 1 | 72 | 1 | 256.10 | 0.00 | 256.10 | 462.95 | 68090.16 | 1144.54 | 34499.01 | 520.56 | 334.90 | 2000.00 |
| 249 | 1 | 2 | 72 | 1 | 289.38 | 7000.00 | 167.69 | 401.42 | 29580.27 | 1070.90 | 14587.34 | 550.68 | 378.42 | 2000.00 |
| 250 | 1 | 3 | 72 | 1 | 485.42 | 7000.00 | 485.42 | 877.49 | 24030.89 | 967.74 | 12358.74 | 397.48 | 634.78 | 2000.00 |
| 251 | 1 | 4 | 72 | 1 | 1264.90 | 15000.00 | 1130.46 | 2152.11 | 110000.00 | 707.37 | 55000.00 | 207.75 | 1654.10 | 2569.22 |
| 252 | 1 | 5 | 72 | 1 | 7194.20 | 196500.00 | 4242.43 | 10053.13 | 544000.00 | 2994.90 | 276000.00 | 1663.13 | 9407.80 | 14065.83 |
| 253 | 1 | 6 | 72 | 1 | 1713.40 | 196498.04 | 1713.43 | 3097.33 | 544000.00 | 3097.33 | 276000.00 | 1252.10 | 2240.60 | 6590.03 |
| 254 | 1 | 7 | 72 | 1 | 1409.72 | 196500.00 | 1409.69 | 2548.31 | 508458.82 | 3126.32 | 276000.00 | 1030.18 | 1843.48 | 5999.98 |
| 255 | 1 | 8 | 72 | 1 | 396.02 | 184260.09 | 505.08 | 752.25 | 375000.00 | 2922.72 | 190000.00 | 1622.27 | 400.18 | 4945.16 |
| 256 | 1 | 9 | 72 | 1 | 75.66 | 134939.42 | 904.51 | 965.62 | 257353.45 | 2942.71 | 136263.18 | 958.35 | 98.94 | 4000.00 |
| 257 | 1 | 10 | 72 | 1 | 335.14 | 77857.63 | 1262.82 | 1533.51 | 184481.55 | 2718.64 | 99481.55 | 843.10 | 438.26 | 4000.00 |
| 258 | 1 | 11 | 72 | 1 | 767.00 | 56976.10 | 1118.59 | 1738.09 | 158689.44 | 2171.54 | 83714.94 | 825.46 | 1003.00 | 4000.00 |
| 259 | 1 | 12 | 72 | 1 | 853.84 | 31685.67 | 1265.14 | 1954.78 | 145507.17 | 2169.17 | 78161.86 | 714.27 | 1116.56 | 4000.00 |
| 260 | 1 | 1 | 73 | 1 | 756.86 | 22057.44 | 913.45 | 1524.76 | 109230.75 | 2114.73 | 57105.54 | 895.53 | 989.74 | 4000.00 |

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| LOC NO= | | | | | 1. | 1. | 1. | 2. | 2. | 2. | 3. | 3. | 4. | . |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PER | DY | MO | YR | DW | BRASSUA INFLOW | BRASSUA EOP STOR | BRASSUA CUTFLOW | MOOSEHEAD INFLOW | MOOSEHEAD EOP STOR | MOOSEHEAD CUTFLOW | FLAGGSTAF EOP STOR | FLAGGSTAF OUTFLOW | BINGHAM G LOCAL IN | BINGHAM G FLOW RES |
| 261 | 1 | 2 | 73 | 1 | 998.40 | 18047.48 | 1070.60 | 1877.00 | 105371.13 | 1946.50 | 56089.03 | 747.90 | 1305.60 | 4000.00 |
| 262 | 1 | 3 | 73 | 1 | 1575.86 | 34333.54 | 1311.00 | 2583.81 | 135000.00 | 2101.95 | 75000.00 | 844.04 | 2060.74 | 5006.72 |
| 263 | 1 | 4 | 73 | 1 | 4898.40 | 196500.00 | 2173.14 | 6129.54 | 380538.83 | 2003.19 | 193322.73 | 1591.15 | 6405.60 | 9999.94 |
| 264 | 1 | 5 | 73 | 1 | 3582.80 | 196500.00 | 3582.80 | 6476.60 | 544000.00 | 3818.20 | 276000.00 | 1273.60 | 4685.20 | 9777.00 |
| 265 | 1 | 6 | 73 | 1 | 1478.10 | 196498.04 | 1478.13 | 2671.98 | 531619.61 | 2880.04 | 269639.43 | 1187.04 | 1932.90 | 5999.98 |
| 266 | 1 | 7 | 73 | 1 | 1513.46 | 195318.40 | 1532.64 | 2755.05 | 525128.77 | 2860.62 | 266304.69 | 1160.22 | 1979.14 | 5999.98 |
| 267 | 1 | 8 | 73 | 1 | 1019.72 | 189594.25 | 1112.81 | 1936.43 | 444180.86 | 3252.91 | 225204.46 | 1413.60 | 1333.48 | 5999.99 |
| 268 | 1 | 9 | 73 | 1 | 959.66 | 160249.74 | 1452.80 | 2227.91 | 372305.44 | 3435.80 | 189028.08 | 1309.25 | 1254.94 | 5999.99 |
| 269 | 1 | 10 | 73 | 1 | 988.78 | 126263.42 | 1541.51 | 2340.14 | 304980.67 | 3435.05 | 155249.75 | 1271.91 | 1293.02 | 5999.99 |
| 270 | 1 | 11 | 73 | 1 | 923.78 | 116118.23 | 1094.27 | 1840.40 | 255000.00 | 2680.34 | 130000.00 | 1099.40 | 1208.02 | 4987.76 |
| 271 | 1 | 12 | 73 | 1 | 3619.20 | 196500.00 | 2311.93 | 5235.13 | 525132.52 | 841.91 | 266477.54 | 425.24 | 4732.80 | 5999.95 |
| 272 | 1 | 1 | 74 | 1 | 895.96 | 190587.68 | 992.11 | 1715.77 | 425241.59 | 3340.32 | 215239.88 | 1488.03 | 1171.64 | 5999.99 |
| 273 | 1 | 2 | 74 | 1 | 475.54 | 158490.51 | 1053.47 | 1437.56 | 212166.05 | 5274.13 | 234539.90 | 0.00 | 621.86 | 5895.99 |
| 274 | 1 | 3 | 74 | 1 | 1177.28 | 196500.00 | 559.12 | 1510.00 | 135000.00 | 2764.97 | 75000.00 | 3454.95 | 1539.52 | 7759.44 |
| 275 | 1 | 4 | 74 | 1 | 4186.00 | 196500.00 | 4186.00 | 7567.00 | 379955.88 | 3450.44 | 193027.88 | 1075.50 | 5474.00 | 9999.95 |
| 276 | 1 | 5 | 74 | 1 | 5738.20 | 196500.00 | 5738.20 | 10372.90 | 544000.00 | 7705.02 | 276000.00 | 2843.91 | 7503.80 | 18052.72 |
| 277 | 1 | 6 | 74 | 1 | 1562.86 | 196458.04 | 1562.89 | 2825.20 | 544000.00 | 2825.20 | 276000.00 | 1142.09 | 2043.74 | 6011.03 |
| 278 | 1 | 7 | 74 | 1 | 1000.22 | 196500.00 | 1000.19 | 1808.06 | 456545.07 | 3230.36 | 231069.03 | 1461.65 | 1307.98 | 5999.99 |
| 279 | 1 | 8 | 74 | 1 | 406.90 | 166381.08 | 896.73 | 1225.38 | 375000.00 | 2551.56 | 190000.00 | 965.26 | 532.10 | 4048.93 |
| 280 | 1 | 9 | 74 | 1 | 282.62 | 128866.50 | 913.06 | 1141.33 | 282541.70 | 2695.12 | 146634.82 | 935.30 | 369.58 | 4000.00 |
| 281 | 1 | 10 | 74 | 1 | 166.40 | 84750.30 | 883.87 | 1018.27 | 175845.68 | 2753.49 | 90845.68 | 1028.91 | 217.60 | 4000.00 |
| 282 | 1 | 11 | 74 | 1 | 639.08 | 56202.26 | 1118.84 | 1635.02 | 135000.00 | 2321.44 | 70000.00 | 817.34 | 835.72 | 3974.50 |
| 283 | 1 | 12 | 74 | 1 | 1209.00 | 22747.17 | 1753.09 | 2729.59 | 182922.12 | 1950.22 | 95500.49 | 468.78 | 1581.00 | 4000.00 |
| 284 | 1 | 1 | 75 | 1 | 506.48 | 30511.39 | 380.21 | 789.29 | 95206.15 | 2215.83 | 49277.85 | 1121.85 | 662.32 | 4000.00 |
| 285 | 1 | 2 | 75 | 1 | 359.32 | 0.00 | 908.70 | 1198.92 | 75000.00 | 1562.74 | 38000.00 | 465.65 | 469.88 | 2498.27 |
| 286 | 1 | 3 | 75 | 1 | 901.94 | 6402.51 | 797.81 | 1526.30 | 49143.28 | 1963.08 | 25803.82 | 857.46 | 1179.46 | 4000.00 |
| 287 | 1 | 4 | 75 | 1 | 2186.86 | 17521.61 | 2000.00 | 3766.31 | 110000.00 | 2726.79 | 55000.00 | 1107.44 | 2859.74 | 6693.97 |
| 288 | 1 | 5 | 75 | 1 | 4245.80 | 155612.49 | 2000.00 | 5429.30 | 345000.00 | 1607.45 | 194111.75 | 840.30 | 5552.20 | 7999.94 |
| 289 | 1 | 6 | 75 | 1 | 1678.04 | 196500.00 | 990.91 | 2346.25 | 427982.31 | 951.71 | 216267.19 | 853.93 | 2194.36 | 4000.00 |
| 290 | 1 | 7 | 75 | 1 | 281.58 | 185427.89 | 461.65 | 689.08 | 345000.00 | 2038.64 | 175000.00 | 876.91 | 368.22 | 3283.76 |
| 291 | 1 | 8 | 75 | 1 | 69.42 | 122889.43 | 1086.50 | 1142.57 | 285000.00 | 2118.36 | 145000.00 | 538.63 | 90.78 | 2747.76 |
| 292 | 1 | 9 | 75 | 1 | 260.00 | 83111.31 | 928.48 | 1138.48 | 225000.00 | 2146.80 | 115000.00 | 694.16 | 340.00 | 3180.96 |
| 293 | 1 | 10 | 75 | 1 | 626.60 | 46287.56 | 1225.47 | 1731.57 | 182028.52 | 2430.43 | 97028.52 | 750.17 | 819.40 | 4000.00 |
| 294 | 1 | 11 | 75 | 1 | 825.50 | 41428.59 | 907.16 | 1573.91 | 153888.77 | 2046.80 | 80535.61 | 873.70 | 1079.50 | 4000.00 |
| 295 | 1 | 12 | 75 | 1 | 728.00 | 24250.77 | 1007.37 | 1595.37 | 117929.60 | 2180.18 | 60286.40 | 867.82 | 952.00 | 4000.00 |
| 296 | 1 | 1 | 76 | 1 | 520.00 | 2232.50 | 878.09 | 1298.09 | 75000.00 | 1996.26 | 38000.00 | 742.45 | 680.00 | 3418.71 |
| 297 | 1 | 2 | 76 | 1 | 889.20 | 6593.09 | 813.39 | 1531.59 | 75000.00 | 1531.59 | 38000.00 | 649.80 | 1162.80 | 3344.19 |
| 298 | 1 | 3 | 76 | 1 | 2111.20 | 36000.00 | 1730.53 | 3435.73 | 135000.00 | 2459.94 | 75000.00 | 941.06 | 2760.80 | 6161.80 |
| 299 | 1 | 4 | 76 | 1 | 4953.00 | 196500.00 | 2154.92 | 6155.42 | 385959.60 | 1937.96 | 196064.51 | 1584.97 | 6477.00 | 9999.94 |
| 300 | 1 | 5 | 76 | 1 | 2834.00 | 196500.00 | 2834.00 | 5123.00 | 504427.55 | 3196.33 | 255915.49 | 1097.63 | 3706.00 | 7999.96 |
| 301 | 1 | 6 | 76 | 1 | 569.40 | 194718.97 | 599.33 | 1059.23 | 434621.40 | 2232.34 | 219798.62 | 1023.06 | 744.60 | 4000.00 |
| 302 | 1 | 7 | 76 | 1 | 2012.40 | 195481.42 | 2000.00 | 3625.40 | 504792.48 | 2484.19 | 255856.69 | 884.18 | 2631.60 | 5999.97 |
| 303 | 1 | 8 | 76 | 1 | 1840.80 | 185692.46 | 2000.00 | 3486.80 | 544000.00 | 2849.16 | 276000.00 | 1017.61 | 2407.20 | 6273.97 |
| 304 | 1 | 9 | 76 | 1 | 465.40 | 196500.00 | 283.78 | 659.68 | 370541.97 | 3574.69 | 188134.80 | 1816.70 | 608.60 | 5999.99 |
| 305 | 1 | 10 | 76 | 1 | 1749.80 | 181115.58 | 2000.00 | 3413.30 | 410428.32 | 2764.62 | 208520.88 | 947.16 | 2288.20 | 5999.98 |
| 306 | 1 | 11 | 76 | 1 | 1068.60 | 157783.87 | 1460.70 | 2323.80 | 351211.95 | 3318.95 | 178605.34 | 1283.64 | 1397.40 | 5999.99 |
| 307 | 1 | 12 | 76 | 1 | 938.60 | 127435.26 | 1432.17 | 2190.27 | 273653.58 | 3451.61 | 139555.57 | 1320.97 | 1227.40 | 5999.99 |
| 308 | 1 | 1 | 77 | 1 | 280.80 | 90118.76 | 887.69 | 1114.49 | 180169.13 | 2634.84 | 90810.09 | 997.96 | 367.20 | 4000.00 |
| 309 | 1 | 2 | 77 | 1 | 208.00 | 53138.15 | 873.86 | 1041.86 | 85608.14 | 2744.50 | 44630.09 | 983.50 | 272.00 | 4000.00 |
| 310 | 1 | 3 | 77 | 1 | 6344.00 | 196500.00 | 4012.48 | 9136.48 | 544000.00 | 1681.56 | 276000.00 | 873.18 | 8296.00 | 10850.74 |
| 311 | 1 | 4 | 77 | 1 | 3692.00 | 196500.00 | 3692.00 | 6674.00 | 544000.00 | 6674.00 | 276000.00 | 2698.00 | 4828.00 | 14200.00 |
| 312 | 1 | 5 | 77 | 1 | 912.60 | 196498.04 | 912.63 | 1649.73 | 360866.49 | 4628.07 | 183052.84 | 2178.52 | 1193.40 | 7999.99 |

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| LOC NO= | | | | | 1. | 1. | 1. | 2. | 2. | 2. | 3. | 3. | 4. | 4. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PER | DY | MO | YR | DW | BRASSUA INFLOW | BRASSUA EOP STOR | BRASSUA OUTFLOW | MOOSEHEAD INFLOW | MOOSEHEAD EOP STOR | MOOSEHEAD OUTFLOW | FLAGGSTAF EOP STOR | FLAGGSTAF OUTFLOW | BINGHAM 6 LOCAL IN | BINGHAM 6 FLOW REG |
| 313 | 1 | 6 | 77 | 1 | 1768.00 | 188257.23 | 1906.49 | 3334.49 | 435000.00 | 2088.65 | 220000.00 | 671.09 | 2312.00 | 5071.74 |
| 314 | 1 | 7 | 77 | 1 | 392.60 | 185310.97 | 440.52 | 757.62 | 345000.00 | 2221.30 | 175000.00 | 1018.74 | 513.40 | 3753.45 |
| 315 | 1 | 8 | 77 | 1 | 626.60 | 122847.52 | 1642.46 | 2148.56 | 318118.52 | 2585.73 | 166578.21 | 594.87 | 819.40 | 4000.00 |
| 316 | 1 | 9 | 77 | 1 | 1053.00 | 125000.00 | 1016.83 | 1867.33 | 315000.00 | 1919.73 | 160000.00 | 880.05 | 1377.00 | 4176.78 |
| 317 | 1 | 10 | 77 | 1 | 4264.00 | 196500.00 | 3101.18 | 6545.18 | 544000.00 | 2820.91 | 276000.00 | 1229.47 | 5576.00 | 9626.38 |
| 318 | 1 | 11 | 77 | 1 | 1791.40 | 196498.04 | 1791.43 | 3238.33 | 544000.00 | 3238.33 | 276000.00 | 1309.10 | 2342.60 | 6890.03 |
| 319 | 1 | 12 | 77 | 1 | 889.20 | 196500.00 | 889.17 | 1607.37 | 438569.45 | 3322.01 | 222788.97 | 1515.18 | 1162.80 | 5999.99 |
| 320 | 1 | 1 | 78 | 1 | 2652.00 | 196500.00 | 2652.00 | 4794.00 | 544000.00 | 3079.36 | 276000.00 | 1072.62 | 3468.00 | 7619.98 |
| 321 | 1 | 2 | 78 | 1 | 842.40 | 196498.04 | 842.44 | 1522.84 | 390717.70 | 4282.79 | 276000.00 | 615.60 | 1101.60 | 5999.99 |
| 322 | 1 | 3 | 78 | 1 | 728.00 | 196500.00 | 727.97 | 1315.97 | 226841.36 | 3981.12 | 120134.75 | 3066.87 | 952.00 | 7999.99 |
| 323 | 1 | 4 | 78 | 1 | 3900.00 | 196500.00 | 3900.00 | 7050.00 | 427452.76 | 3678.66 | 217051.39 | 1221.29 | 5100.00 | 9999.95 |
| 324 | 1 | 5 | 78 | 1 | 3536.00 | 196500.00 | 3536.00 | 6392.00 | 544000.00 | 4496.57 | 276000.00 | 1625.31 | 4624.00 | 10745.88 |
| 325 | 1 | 6 | 78 | 1 | 1040.00 | 196498.04 | 1040.03 | 1880.03 | 465383.11 | 3201.21 | 235609.67 | 1438.77 | 1360.00 | 5999.99 |
| 326 | 1 | 7 | 78 | 1 | 309.40 | 188997.07 | 431.39 | 681.29 | 353862.65 | 2494.97 | 181848.41 | 1100.43 | 404.60 | 4000.00 |
| 327 | 1 | 8 | 78 | 1 | 158.60 | 127346.13 | 1161.24 | 1289.34 | 285000.00 | 2409.27 | 145000.00 | 715.17 | 207.40 | 3331.94 |
| 328 | 1 | 9 | 78 | 1 | 106.60 | 84187.07 | 831.90 | 918.00 | 225000.00 | 1926.32 | 115000.00 | 582.06 | 139.40 | 2647.78 |
| 329 | 1 | 10 | 78 | 1 | 157.30 | 46732.70 | 766.43 | 893.48 | 170000.00 | 1787.95 | 85000.00 | 602.85 | 205.70 | 2596.50 |
| 330 | 1 | 11 | 78 | 1 | 150.80 | 12856.66 | 720.10 | 841.90 | 134591.01 | 1436.96 | 69787.93 | 365.84 | 197.20 | 2000.00 |
| 331 | 1 | 12 | 78 | 1 | 96.20 | 0.00 | 305.29 | 382.99 | 78006.23 | 1303.24 | 39003.11 | 570.96 | 125.80 | 2000.00 |
| 332 | 1 | 1 | 79 | 1 | 540.80 | 0.00 | 540.80 | 977.60 | 75000.00 | 1026.49 | 38000.00 | 411.51 | 707.20 | 2145.20 |
| 333 | 1 | 2 | 79 | 1 | 327.60 | 0.00 | 327.60 | 592.20 | 47722.49 | 1083.35 | 24179.39 | 488.25 | 428.40 | 2000.00 |
| 334 | 1 | 3 | 79 | 1 | 3120.00 | 68867.12 | 2000.00 | 4520.00 | 161143.33 | 2675.41 | 87847.94 | 1244.55 | 4080.00 | 7999.96 |
| 335 | 1 | 4 | 79 | 1 | 4524.00 | 196500.00 | 2379.09 | 6033.09 | 372461.58 | 2481.82 | 189237.33 | 1602.12 | 5916.00 | 9999.94 |
| 336 | 1 | 5 | 79 | 1 | 3068.00 | 196500.00 | 3068.00 | 5546.00 | 527653.93 | 3022.08 | 267703.75 | 965.88 | 4012.00 | 7999.96 |
| 337 | 1 | 6 | 79 | 1 | 1274.00 | 195764.38 | 1286.36 | 2315.36 | 484967.44 | 3032.72 | 245671.35 | 1301.26 | 1666.00 | 5999.98 |
| 338 | 1 | 7 | 79 | 1 | 361.40 | 150756.10 | 442.20 | 734.10 | 378419.81 | 2466.91 | 196702.27 | 1060.49 | 472.60 | 4000.00 |
| 339 | 1 | 8 | 79 | 1 | 249.60 | 136794.57 | 1127.84 | 1329.44 | 291881.24 | 2736.83 | 150217.33 | 936.77 | 326.40 | 4000.00 |
| 340 | 1 | 9 | 79 | 1 | 345.80 | 88676.43 | 1154.44 | 1433.74 | 225000.00 | 2557.70 | 115000.00 | 846.22 | 452.20 | 3856.12 |
| 341 | 1 | 10 | 79 | 1 | 878.80 | 48590.37 | 1530.73 | 2240.53 | 224515.59 | 2248.41 | 117447.60 | 602.39 | 1149.20 | 4000.00 |
| 342 | 1 | 11 | 79 | 1 | 1097.20 | 61631.12 | 878.05 | 1764.25 | 226107.46 | 1737.49 | 115506.08 | 827.71 | 1434.80 | 4000.00 |
| 343 | 1 | 12 | 79 | 1 | 676.00 | 57625.03 | 741.45 | 1287.15 | 170289.41 | 2194.93 | 89646.31 | 921.07 | 884.00 | 4000.00 |
| 344 | 1 | 1 | 80 | 1 | 286.00 | 37115.42 | 619.55 | 850.55 | 75000.00 | 2400.26 | 38000.00 | 1048.93 | 374.00 | 3823.20 |
| 345 | 1 | 2 | 80 | 1 | 130.00 | 7000.00 | 653.55 | 758.55 | 37721.13 | 1406.64 | 19112.04 | 423.36 | 170.00 | 2000.00 |
| 346 | 1 | 3 | 80 | 1 | 577.20 | 7000.00 | 577.20 | 1043.40 | 35000.00 | 1087.65 | 18000.00 | 439.89 | 754.80 | 2282.34 |
| 347 | 1 | 4 | 80 | 1 | 2990.00 | 65909.95 | 2000.00 | 4415.00 | 132758.05 | 2772.15 | 69599.50 | 1317.85 | 3910.00 | 8000.00 |
| 348 | 1 | 5 | 80 | 1 | 1287.00 | 85784.08 | 963.78 | 2003.28 | 200000.00 | 909.71 | 100000.00 | 446.09 | 1683.00 | 3038.80 |
| 349 | 1 | 6 | 80 | 1 | 356.20 | 98530.05 | 142.00 | 429.70 | 165542.50 | 1008.77 | 84223.38 | 525.43 | 465.80 | 2000.00 |
| 350 | 1 | 7 | 80 | 1 | 273.00 | 76809.30 | 626.25 | 846.75 | 141365.44 | 1239.95 | 71707.11 | 403.05 | 357.00 | 2000.00 |
| 351 | 1 | 8 | 80 | 1 | 260.00 | 28421.21 | 1046.95 | 1256.95 | 132539.67 | 1400.48 | 67432.47 | 259.52 | 340.00 | 2000.00 |
| 352 | 1 | 9 | 80 | 1 | 213.20 | 0.00 | 690.83 | 863.03 | 104676.26 | 1331.28 | 53501.20 | 389.92 | 278.80 | 2000.00 |
| 353 | 1 | 10 | 80 | 1 | 642.20 | 0.00 | 642.20 | 1160.90 | 124718.03 | 834.96 | 62359.02 | 325.24 | 839.80 | 2000.00 |
| 354 | 1 | 11 | 80 | 1 | 704.60 | 20303.29 | 363.40 | 932.50 | 135000.00 | 759.71 | 70000.00 | 386.49 | 921.40 | 2067.50 |
| 355 | 1 | 12 | 80 | 1 | 709.80 | 13703.38 | 817.14 | 1390.44 | 110000.00 | 1797.02 | 55000.00 | 762.65 | 928.20 | 3487.86 |
| 356 | 1 | 1 | 81 | 1 | 215.80 | 0.00 | 438.66 | 612.96 | 70859.63 | 1249.51 | 35902.21 | 468.29 | 282.20 | 2000.00 |
| 357 | 1 | 2 | 81 | 1 | 2207.40 | 50000.00 | 1307.12 | 3090.02 | 165000.00 | 1394.95 | 85000.00 | 729.06 | 2886.60 | 5010.61 |
| 358 | 1 | 3 | 81 | 1 | 670.80 | 82515.12 | 142.00 | 683.80 | 83789.08 | 2004.55 | 46382.13 | 1118.25 | 877.20 | 4000.00 |
| 359 | 1 | 4 | 81 | 1 | 1313.00 | 41635.18 | 2000.00 | 3060.50 | 110000.00 | 2620.02 | 55000.00 | 814.67 | 1717.00 | 5151.69 |
| 360 | 1 | 5 | 81 | 1 | 1222.00 | 69322.59 | 771.71 | 1758.71 | 200000.00 | 295.03 | 100000.00 | 161.16 | 1598.00 | 2054.18 |
| 361 | 1 | 6 | 81 | 1 | 959.40 | 112714.40 | 230.19 | 1005.09 | 236730.04 | 387.83 | 120441.60 | 357.57 | 1254.60 | 2000.00 |
| 362 | 1 | 7 | 81 | 1 | 460.20 | 123855.13 | 279.02 | 650.72 | 220195.30 | 919.62 | 111693.27 | 478.58 | 601.80 | 2000.00 |
| 363 | 1 | 8 | 81 | 1 | 520.00 | 78033.15 | 1265.21 | 1685.21 | 250343.03 | 1194.91 | 127367.51 | 125.09 | 680.00 | 2000.00 |
| 364 | 1 | 9 | 81 | 1 | 998.40 | 66507.37 | 1192.09 | 1998.49 | 247506.83 | 2046.16 | 132208.69 | 648.24 | 1305.60 | 4000.00 |

| PER | DY | MO | YR | DW | BRASSUA INFLOW | BRASSUA EOP STOR | BRASSUA OUTFLOW | MOOSEHEAD INFLOW | MOOSEHEAD EOP STOR | MOOSEHEAD OUTFLOW | FLAGGSTAF EOP STOR | FLAGGSTAF OUTFLOW | BINGHAM 6 LOCAL IN | BINGHAM 6 FLOW REG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOC NO= | | | | | 1. | 1. | 1. | 2. | 2. | 2. | 3. | 3. | 4. | [illegible] |
| 365 | 1 | 10 | 81 | 1 | 1729.00 | 95000.00 | 1265.62 | 2662.12 | 259113.64 | 2473.35 | 132078.17 | 1265.62 | 2261.00 | 5999.98 |
| 366 | 1 | 11 | 81 | 1 | 1302.60 | 96070.24 | 1284.61 | 2336.71 | 255000.00 | 2405.85 | 130000.00 | 986.82 | 1703.40 | 5096.37 |
| 367 | 1 | 12 | 81 | 1 | 665.60 | 80320.46 | 921.74 | 1459.34 | 206007.67 | 2256.11 | 106198.68 | 873.49 | 870.40 | 4000.00 |
| 368 | 1 | 1 | 82 | 1 | 603.20 | 54456.98 | 1023.82 | 1511.02 | 155425.58 | 2333.65 | 79343.56 | 877.55 | 788.80 | 4000.00 |
| 369 | 1 | 2 | 82 | 1 | 405.60 | 37470.79 | 711.45 | 1039.05 | 76995.45 | 2451.24 | 39247.16 | 1018.36 | 530.40 | 4000.00 |
| 370 | 1 | 3 | 82 | 1 | 574.60 | 0.00 | 1184.00 | 1648.10 | 35000.00 | 2331.08 | 18000.00 | 765.45 | 751.40 | 3847.92 |
| 371 | 1 | 4 | 82 | 1 | 4342.00 | 139360.71 | 2000.00 | 5507.00 | 285000.00 | 1305.67 | 145000.00 | 1038.73 | 5678.00 | 8022.40 |
| 372 | 1 | 5 | 82 | 1 | 1887.60 | 196500.00 | 958.33 | 2482.93 | 345000.00 | 1507.14 | 175000.00 | 891.50 | 2468.40 | 4867.34 |
| 373 | 1 | 6 | 82 | 1 | 678.60 | 187543.17 | 829.12 | 1377.22 | 296231.03 | 2196.80 | 150013.85 | 915.80 | 887.40 | 4000.00 |
| 374 | 1 | 7 | 82 | 1 | 214.50 | 149544.16 | 832.49 | 1005.74 | 273342.77 | 1377.97 | 138652.13 | 341.53 | 280.50 | 2000.00 |
| 375 | 1 | 8 | 82 | 1 | 267.80 | 95913.60 | 1140.00 | 1356.30 | 269080.84 | 1425.62 | 136500.78 | 224.18 | 350.20 | 2000.00 |
| 376 | 1 | 9 | 82 | 1 | 252.20 | 73923.72 | 621.75 | 825.45 | 225000.00 | 1566.24 | 115000.00 | 552.35 | 329.80 | 2448.39 |
| 377 | 1 | 10 | 82 | 1 | 227.50 | 44103.95 | 712.47 | 896.22 | 170000.00 | 1790.69 | 85000.00 | 654.15 | 297.50 | 2742.34 |
| 378 | 1 | 11 | 82 | 1 | 1170.00 | 34854.48 | 1325.44 | 2270.44 | 193153.91 | 1881.33 | 100848.06 | 588.67 | 1530.00 | 4000.00 |
| 379 | 1 | 12 | 82 | 1 | 587.60 | 36159.50 | 566.38 | 1040.98 | 122424.18 | 2191.27 | 63282.79 | 1040.33 | 768.40 | 4000.00 |
| 380 | 1 | 1 | 83 | 1 | 803.40 | 16687.75 | 1120.07 | 1768.97 | 98248.35 | 2162.15 | 50975.82 | 787.25 | 1050.60 | 4000.00 |
| 381 | 1 | 2 | 83 | 1 | 1703.00 | 58900.00 | 1103.19 | 2478.69 | 165000.00 | 1276.78 | 85000.00 | 631.87 | 2227.00 | 4135.65 |
| 382 | 1 | 3 | 83 | 1 | 2563.60 | 196500.00 | 181.04 | 2251.64 | 140277.22 | 2653.71 | 77593.45 | 1993.85 | 3352.40 | 7999.37 |
| 383 | 1 | 4 | 83 | 1 | 5512.00 | 196500.00 | 5512.00 | 9964.00 | 544000.00 | 3179.31 | 276000.00 | 693.72 | 7208.00 | 11081.03 |
| 384 | 1 | 5 | 83 | 1 | 2782.00 | 196500.00 | 2782.00 | 5029.00 | 544000.00 | 5029.00 | 276000.00 | 2033.00 | 3638.00 | 10700.00 |
| 385 | 1 | 6 | 83 | 1 | 1066.00 | 196498.04 | 1066.03 | 1927.03 | 469314.06 | 3182.15 | 237629.24 | 1423.83 | 1394.00 | 5999.99 |
| 386 | 1 | 7 | 83 | 1 | 509.60 | 189372.22 | 625.49 | 1037.09 | 387989.73 | 2359.68 | 200642.83 | 973.92 | 666.40 | 4000.00 |
| 387 | 1 | 8 | 83 | 1 | 291.20 | 139714.85 | 1098.79 | 1333.99 | 302601.72 | 2722.67 | 158601.33 | 896.53 | 380.80 | 4000.00 |
| 388 | 1 | 9 | 83 | 1 | 241.80 | 93566.51 | 1017.34 | 1212.64 | 225000.00 | 2516.76 | 115000.00 | 909.43 | 316.20 | 3742.39 |
| 389 | 1 | 10 | 83 | 1 | 299.00 | 50613.85 | 997.55 | 1239.05 | 170000.00 | 2133.52 | 85000.00 | 706.40 | 391.00 | 3230.92 |
| 390 | 1 | 11 | 83 | 1 | 2834.00 | 100241.02 | 2000.00 | 4289.00 | 329375.67 | 1610.64 | 167573.87 | 683.32 | 3706.00 | 5999.96 |
| 391 | 1 | 12 | 83 | 1 | 2493.40 | 196500.00 | 927.92 | 2941.82 | 412037.86 | 1597.47 | 209398.42 | 1141.90 | 3260.60 | 5999.37 |
| 392 | 1 | 1 | 84 | 1 | 540.80 | 155140.10 | 1213.44 | 1650.24 | 280550.04 | 3788.66 | 141211.65 | 1504.14 | 707.20 | 5999.99 |
| 393 | 1 | 2 | 84 | 1 | 746.20 | 103567.76 | 1642.77 | 2245.47 | 165000.00 | 4254.29 | 128292.29 | 769.90 | 975.80 | 5999.99 |
| 394 | 1 | 3 | 84 | 1 | 1326.00 | 176370.15 | 142.00 | 1213.00 | 135000.00 | 1700.90 | 75000.00 | 1835.70 | 1734.00 | 5270.60 |
| 395 | 1 | 4 | 84 | 1 | 5746.00 | 196500.00 | 5407.71 | 10048.71 | 544000.00 | 3175.34 | 276000.00 | 821.13 | 7514.00 | 11510.47 |
| 396 | 1 | 5 | 84 | 1 | 3510.00 | 196500.00 | 3510.00 | 6345.00 | 544000.00 | 6345.00 | 276000.00 | 2565.00 | 4590.00 | 13500.00 |
| 397 | 1 | 6 | 84 | 1 | 3016.00 | 196500.00 | 3016.00 | 5452.00 | 544000.00 | 5452.00 | 276000.00 | 2204.00 | 3944.00 | 11600.00 |
| 398 | 1 | 7 | 84 | 1 | 1047.80 | 196498.04 | 1047.83 | 1894.13 | 463981.09 | 3195.50 | 234889.37 | 1434.29 | 1370.20 | 5999.99 |
| 399 | 1 | 8 | 84 | 1 | 244.40 | 168941.36 | 692.56 | 889.96 | 356067.90 | 2644.97 | 182204.43 | 1035.43 | 319.60 | 4000.00 |
| 400 | 1 | 9 | 84 | 1 | 130.30 | 123211.06 | 898.51 | 1003.51 | 245158.28 | 2867.38 | 130576.85 | 962.62 | 170.00 | 4000.00 |
| 401 | 1 | 10 | 84 | 1 | 179.40 | 69321.27 | 1055.82 | 1200.72 | 170000.00 | 2423.03 | 85000.00 | 872.33 | 234.60 | 3529.96 |
| 402 | 1 | 11 | 84 | 1 | 397.80 | 46741.44 | 777.26 | 1098.56 | 135000.00 | 1686.75 | 70000.00 | 542.78 | 520.20 | 2749.73 |
| 403 | 1 | 12 | 84 | 1 | 475.80 | 19290.33 | 922.24 | 1306.54 | 110000.00 | 1713.12 | 55000.00 | 591.65 | 622.20 | 2926.37 |
| 404 | 1 | 1 | 85 | 1 | 392.60 | 0.00 | 706.32 | 1023.42 | 75000.00 | 1592.63 | 38000.00 | 563.37 | 513.40 | 2669.41 |
| 405 | 1 | 2 | 85 | 1 | 829.40 | 2128.53 | 791.07 | 1460.97 | 75000.00 | 1460.97 | 38000.00 | 606.10 | 1084.60 | 3151.67 |
| 406 | 1 | 3 | 85 | 1 | 1414.40 | 6584.21 | 1341.94 | 2484.34 | 126716.67 | 1643.26 | 70371.08 | 507.14 | 1849.60 | 4000.00 |
| 407 | 1 | 4 | 85 | 1 | 2511.60 | 49148.82 | 1796.29 | 3824.89 | 163892.00 | 3200.15 | 89409.44 | 1515.45 | 3284.40 | 8000.00 |
| 408 | 1 | 5 | 85 | 1 | 1196.00 | 90208.91 | 528.36 | 1494.36 | 200000.00 | 907.13 | 100000.00 | 701.76 | 1564.00 | 3172.89 |
| 409 | 1 | 6 | 85 | 1 | 652.60 | 118792.90 | 172.10 | 699.20 | 200000.78 | 699.19 | 101754.78 | 447.41 | 853.40 | 2000.00 |
| 410 | 1 | 7 | 85 | 1 | 455.00 | 112991.56 | 549.35 | 916.85 | 193853.36 | 1016.83 | 98331.41 | 388.17 | 595.00 | 2000.00 |
| 411 | 1 | 8 | 85 | 1 | 187.20 | 65594.79 | 892.97 | 1044.17 | 170255.19 | 1427.95 | 86621.06 | 327.25 | 244.80 | 2000.00 |
| 412 | 1 | 9 | 85 | 1 | 481.00 | 48578.01 | 834.19 | 1222.69 | 177993.06 | 1092.66 | 90974.23 | 278.34 | 629.00 | 2000.00 |
| SUM = | | | | | 504552.88 | 42420241.32 | 506779.37 | 914302.85 | *********** | 920828.85 | 53577303.95 | 371350.73 | 659799.92 | 1951979.50 |
| MAX = | | | | | 7763.60 | 196500.00 | 6047.40 | 12318.00 | 544000.00 | 7705.02 | 276000.00 | 3454.95 | 10152.40 | 18949.26 |
| MIN = | | | | | 16.38 | 0.00 | 142.00 | 173.92 | 22229.46 | 250.00 | 11432.29 | 0.00 | 21.42 | 2000.00 |
| PMAX= | | | | | 216.00 | 24.00 | 216.00 | 216.00 | 37.00 | 276.00 | 37.00 | 274.00 | 216.00 | 216.00 |
| AVG = | | | | | 1224.64 | 102961.75 | 1230.05 | 2219.18 | 252281.53 | 2235.02 | 130042.00 | 901.34 | 1601.46 | 4737.81 |